

## DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

Bio-Strategy Pty Ltd

Chemwatch Hazard Alert Code: 4

Chemwatch: 1155  
Version No: 7.1.1.1

Issue Date: 27/11/2015  
Print Date: 29/08/2017  
S.GHS.AUS.EN.RISK

Safety Data Sheet according to WHS and ADG requirements

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

#### Product Identifier

|                               |                                                                                                                                                                                   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product name                  | DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT                                                                                                        |
| Chemical Name                 | diethyl ether                                                                                                                                                                     |
| Synonyms                      | 1,1-oxybisethane, C4-H10-O, anaesthesia ether, anaesthetic, diethyl oxide, ether, ethoxy ethane, ethyl ether, ethyl oxide, inhibited diethyl ether, solvent ether, sulfuric ether |
| Proper shipping name          | DIETHYL ETHER (ETHYL ETHER)                                                                                                                                                       |
| Chemical formula              | C4H10O                                                                                                                                                                            |
| Other means of identification | 23811326, 23811, 23811463                                                                                                                                                         |
| CAS number                    | 60-29-7                                                                                                                                                                           |

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

|                          |                                                                                                                                                                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant identified uses | As a solvent and for solvent extraction of waxes, fats, oils, perfumes, alkaloids, gums. Ether / alcohol mix is a good solvent for nitrocellulose. Used in the manufacture of gun powder and organic products, as a primer in gasoline engines. Obsolescent use as a medical anaesthetic by inhalation. |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

|                         |                                                |
|-------------------------|------------------------------------------------|
| Registered company name | Bio-Strategy Pty Ltd                           |
| Address                 | Unit 1A/60 Enterprise Place QLD 4173 Australia |
| Telephone               | 1300 727 696                                   |
| Fax                     | Not Available                                  |
| Website                 | www.bio-strategy.com.au                        |
| Email                   | csaus@bio-strategy.com                         |

#### Emergency telephone number

|                                   |               |
|-----------------------------------|---------------|
| Association / Organisation        | Not Available |
| Emergency telephone numbers       | 07 3009 4188  |
| Other emergency telephone numbers | Not Available |


### SECTION 2 HAZARDS IDENTIFICATION

#### Classification of the substance or mixture

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

|                    |                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Poisons Schedule   | S6                                                                                                                                                                                                                                                                                                                                   |
| Classification [1] | Flammable Liquid Category 1, Acute Toxicity (Oral) Category 4, Skin Sensitizer Category 1*, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation)*, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Acute Aquatic Hazard Category 3<br><i>*LIMITED EVIDENCE</i> |
| Legend:            | 1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI                                                                                                                                                                                                       |

#### Label elements

|                     |                                                                                     |
|---------------------|-------------------------------------------------------------------------------------|
| Hazard pictogram(s) |  |
| SIGNAL WORD         | <b>DANGER</b>                                                                       |

#### Hazard statement(s)

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

|        |                                                       |
|--------|-------------------------------------------------------|
| H224   | Extremely flammable liquid and vapour.                |
| H302   | Harmful if swallowed.                                 |
| H317   | May cause an allergic skin reaction.*                 |
| H335   | May cause respiratory irritation.*                    |
| H336   | May cause drowsiness or dizziness.                    |
| H402   | Harmful to aquatic life                               |
| AUH019 | May form explosive peroxides                          |
| AUH066 | Repeated exposure may cause skin dryness and cracking |

\*LIMITED EVIDENCE

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

|      |                                                                            |
|------|----------------------------------------------------------------------------|
| P210 | Keep away from heat/sparks/open flames/hot surfaces. - No smoking.         |
| P271 | Use only outdoors or in a well-ventilated area.                            |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P240 | Ground/bond container and receiving equipment.                             |

Precautionary statement(s) Response

|           |                                                                                    |
|-----------|------------------------------------------------------------------------------------|
| P363      | Wash contaminated clothing before reuse.                                           |
| P370+P378 | In case of fire: Use alcohol resistant foam or normal protein foam for extinction. |
| P302+P352 | IF ON SKIN: Wash with plenty of soap and water.                                    |
| P333+P313 | If skin irritation or rash occurs: Get medical advice/attention.                   |

Precautionary statement(s) Storage

|           |                                              |
|-----------|----------------------------------------------|
| P403+P235 | Store in a well-ventilated place. Keep cool. |
| P405      | Store locked up.                             |

Precautionary statement(s) Disposal

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

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

| CAS No   | %[weight] | Name                                                                       |
|----------|-----------|----------------------------------------------------------------------------|
| 60-29-7  | >=95      | Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent |
|          | }         | inhibitor - typically:                                                     |
| 123-31-9 | < 1^      | hydroquinone                                                               |
|          | }         | but other materials are used also.                                         |

Mixtures

See section above for composition of Substances

SECTION 4 FIRST AID MEASURES

Description of first aid measures

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eye Contact  | <p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with fresh running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Seek medical attention without delay; if pain persists or recurs seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>                       |
| Skin Contact | <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>                                                                                                                                                                                                                                                                         |
| Inhalation   | <ul style="list-style-type: none"> <li>▶ If fumes or combustion products are inhaled remove from contaminated area.</li> <li>▶ Lay patient down. Keep warm and rested.</li> <li>▶ Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>▶ Transport to hospital, or doctor.</li> </ul> |
| Ingestion    | <ul style="list-style-type: none"> <li>▶ If swallowed do <b>NOT</b> induce vomiting.</li> <li>▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>▶ Observe the patient carefully.</li> <li>▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> </ul>                                                                                                                                |

Continued...

- ▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- ▶ Seek medical advice.
- ▶ Avoid giving milk or oils.
- ▶ Avoid giving alcohol.
- ▶ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

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

Treat symptomatically.  
for lower alkyl ethers:

#### BASIC TREATMENT

- ▶ Establish a patent airway with suction where necessary.
- ▶ Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- ▶ Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- ▶ A low-stimulus environment must be maintained.
- ▶ Monitor and treat, where necessary, for shock.
- ▶ Anticipate and treat, where necessary, for seizures.
- ▶ **DO NOT use emetics.** Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

#### ADVANCED TREATMENT

- ▶ Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- ▶ Positive-pressure ventilation using a bag-valve mask might be of use.
- ▶ Monitor and treat, where necessary, for arrhythmias.
- ▶ Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- ▶ Drug therapy should be considered for pulmonary oedema.
- ▶ Hypotension without signs of hypovolaemia may require vasopressors.
- ▶ Treat seizures with diazepam.
- ▶ Proparacaine hydrochloride should be used to assist eye irrigation.

#### EMERGENCY DEPARTMENT

- ▶ Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime. Other useful analyses include anion and osmolar gaps, arterial blood gases (ABGs), chest radiographs and electrocardiograph.
- ▶ Ethers may produce anion gap acidosis. Hyperventilation and bicarbonate therapy might be indicated.
- ▶ Haemodialysis might be considered in patients with impaired renal function.
- ▶ Consult a toxicologist as necessary.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

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

### Special hazards arising from the substrate or mixture

#### Fire Incompatibility

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

### Advice for firefighters

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fire Fighting</b>         | <ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ May be violently or explosively reactive.</li> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water course.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Fire/Explosion Hazard</b> | <ul style="list-style-type: none"> <li>▶ Liquid and vapour are highly flammable.</li> <li>▶ Severe fire hazard when exposed to heat, flame and/or oxidisers.</li> <li>▶ Vapour forms an explosive mixture with air.</li> <li>▶ Severe explosion hazard, in the form of vapour, when exposed to flame or spark.</li> </ul> <p>Combustion products include:</p> <ul style="list-style-type: none"> <li>, carbon dioxide (CO<sub>2</sub>)</li> <li>, other pyrolysis products typical of burning organic material.</li> </ul> <p><b>Contains low boiling substance:</b> Closed containers may rupture due to pressure buildup under fire conditions.</p> <p><b>WARNING:</b> Long standing in contact with air and light may result in the formation of potentially explosive peroxides.</p> <p> Material is very volatile.</p> |
| <b>HAZCHEM</b>               | •3YE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

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> </ul>                                                              |
| <b>Major Spills</b> | <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ May be violently or explosively reactive.</li> <li>▶ Wear breathing apparatus plus protective gloves.</li> </ul> <p> Cover spill with foam blanket to reduce fire risk.</p> |

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>▶ Containers, even those that have been emptied, may contain explosive vapours.</li> <li>▶ Do NOT cut, drill, grind, weld or perform similar operations on or near containers.</li> </ul> <p>The tendency of many ethers to form explosive peroxides is well documented. Ethers lacking non-methyl hydrogen atoms adjacent to the ether link are thought to be relatively safe</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT concentrate by evaporation, or evaporate extracts to dryness, as residues may contain explosive peroxides with DETONATION potential.</b></li> <li>▶ Any static discharge is also a source of hazard.</li> <li>▶ Before any distillation process remove trace peroxides by shaking with excess 5% aqueous ferrous sulfate solution or by percolation through a column of activated alumina.</li> </ul> <p><b>Contains low boiling substance:</b><br/>Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.</p> <ul style="list-style-type: none"> <li>▶ Check for bulging containers.</li> <li>▶ Vent periodically</li> <li>▶ Always release caps or seals slowly to ensure slow dissipation of vapours</li> <li>▶ <b>DO NOT allow clothing wet with material to stay in contact with skin</b></li> </ul> <p>The substance accumulates peroxides which may become hazardous only if it evaporates or is distilled or otherwise treated to concentrate the peroxides. The substance may concentrate around the container opening for example.</p> <p>Purchases of peroxidisable chemicals should be restricted to ensure that the chemical is used completely before it can become peroxidised.</p> <ul style="list-style-type: none"> <li>▶ A responsible person should maintain an inventory of peroxidisable chemicals or annotate the general chemical inventory to indicate which chemicals are subject to peroxidation.</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> </ul> |
| <b>Other information</b> | <p>Easily peroxidisable.</p> <ul style="list-style-type: none"> <li>▶ Products formed as a result of peroxidation are not only safety hazards but may chemically alter the chemical behavior of the parent compound.</li> <li>▶ Should have a warning label affixed bearing the date of receipt in the laboratory and the date on which the label was first opened.</li> <li>▶ Store-room items should have the label affixed by the Store-room whilst for non-storeroom items or materials synthesised in the laboratory, an individual chemist should be responsible for warning labels.</li> </ul> <p>Rotate all stock to prevent ageing. Use on FIFO (First In-First Out) basis</p> <ul style="list-style-type: none"> <li>▶ Store in original containers in approved flame-proof area.</li> <li>▶ No smoking, naked lights, heat or ignition sources.</li> <li>▶ <b>DO NOT store in pits, depressions, basements or areas where vapours may be trapped.</b></li> <li>▶ Keep containers securely sealed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Conditions for safe storage, including any incompatibilities

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Suitable container</b>      | <ul style="list-style-type: none"> <li>▶ Packing as supplied by manufacturer.</li> <li>▶ Plastic containers may only be used if approved for flammable liquid.</li> <li>▶ Check that containers are clearly labelled and free from leaks.</li> <li>▶ For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure.</li> <li>▶ For materials with a viscosity of at least 2680 cSt. (23 deg. C)</li> <li>▶ For manufactured product having a viscosity of at least 250 cSt.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Storage incompatibility</b> | <p>Ethers</p> <ul style="list-style-type: none"> <li>· may react violently with strong oxidising agents and acids.</li> <li>· can act as bases.- they form salts with strong acids and addition complexes with Lewis acids; the complex between diethyl ether and boron trifluoride is an example.</li> <li>· are generally stable to water under neutral conditions and ambient temperatures.</li> <li>· are hydrolysed by heating in the presence of halogen acids, particularly hydrogen iodide</li> <li>· are relatively inert in other reactions, which typically involve the breaking of the carbon-oxygen bond</li> </ul> <ul style="list-style-type: none"> <li>▶ The tendency of many ethers to form explosive peroxides is well documented.</li> <li>▶ Ethers lacking non-methyl hydrogen atoms adjacent to the ether link are thought to be relatively safe.</li> <li>▶ When solvents have been freed from peroxides (by percolation through a column of activated alumina for example), the absorbed peroxides must promptly be desorbed by treatment with the polar solvents methanol or water, which should be discarded safely.</li> </ul> <p> Avoid reaction with halogens, interhalogen compounds, sulfur and sulfur compounds.</p> |

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|--------|------------|---------------|-----|------|------|-------|
|--------|------------|---------------|-----|------|------|-------|

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT


|                              |                                                                            |              |                      |                      |               |               |
|------------------------------|----------------------------------------------------------------------------|--------------|----------------------|----------------------|---------------|---------------|
| Australia Exposure Standards | Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent | Ethyl ether  | 1210 mg/m3 / 400 ppm | 1520 mg/m3 / 500 ppm | Not Available | Not Available |
| Australia Exposure Standards | hydroquinone                                                               | Hydroquinone | 2 mg/m3              | Not Available        | Not Available | Not Available |

EMERGENCY LIMITS

| Ingredient                                                                 | Material name | TEEL-1  | TEEL-2   | TEEL-3    |
|----------------------------------------------------------------------------|---------------|---------|----------|-----------|
| Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent | Ethyl ether   | 500 ppm | 3200 ppm | 19000 ppm |
| hydroquinone                                                               | Hydroquinone  | 3 mg/m3 | 20 mg/m3 | 120 mg/m3 |

| Ingredient                                                                 | Original IDLH               | Revised IDLH    |
|----------------------------------------------------------------------------|-----------------------------|-----------------|
| Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent | 19,000 [LEL] ppm            | 1,900 [LEL] ppm |
| hydroquinone                                                               | Unknown mg/m3 / Unknown ppm | 50 mg/m3        |

Exposure controls

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appropriate engineering controls</b> | <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Personal protection</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Eye and face protection</b>          | <ul style="list-style-type: none"> <li>▶ Safety glasses with side shields.</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Skin protection</b>                  | See Hand protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Hands/feet protection</b>            | <ul style="list-style-type: none"> <li>▶ Wear chemical protective gloves, e.g. PVC.</li> <li>▶ Wear safety footwear or safety gumboots, e.g. Rubber</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>▶ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.</li> <li>▶ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.</li> </ul> <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care.</p> |
| <b>Body protection</b>                  | See Other protection below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Other protection</b>                 | <ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ PVC Apron.</li> <li>▶ PVC protective suit may be required if exposure severe.</li> <li>▶ Eyewash unit.</li> <li>• Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.</li> <li>• For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).</li> <li>• Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.</li> </ul>                                                                                                                                                                                                                                                                                  |
| <b>Thermal hazards</b>                  | Not Available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

| Material   | CPI |
|------------|-----|
| PE/EVAL/PE | A   |
| PVA        | A   |
| TEFLON     | A   |
| BUTYL      | C   |

Respiratory protection

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

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

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

| Required Minimum Protection Factor | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|------------------------------------|----------------------|----------------------|------------------------|
| up to 10 x ES                      | Air-line*            | AX-2                 | AX-PAPR-2 ^            |
| up to 20 x ES                      | -                    | AX-3                 | -                      |
| 20+ x ES                           | -                    | Air-line**           | -                      |

## DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

|                  |   |
|------------------|---|
| NEOPRENE         | C |
| NEOPRENE/NATURAL | C |
| NITRILE          | C |
| VITON            | C |
| VITON/NEOPRENE   | C |

\* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

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

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

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

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

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

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

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

## Information on basic physical and chemical properties

|                                                     |                                                                                                                                                                                                                 |                                                |                |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------|
| <b>Appearance</b>                                   | Clear very highly volatile and very highly flammable liquid; slightly soluble in and floats on water. Pleasant aromatic odour. Burning taste. Diethyl ether is hygroscopic; i.e. absorbs moisture from the air. |                                                |                |
| <b>Physical state</b>                               | Liquid                                                                                                                                                                                                          | <b>Relative density (Water = 1)</b>            | 0.714 at 20 C. |
| <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>          | 180-190        |
| <b>pH (as supplied)</b>                             | Not Applicable                                                                                                                                                                                                  | <b>Decomposition temperature</b>               | Not available. |
| <b>Melting point / freezing point (°C)</b>          | -116                                                                                                                                                                                                            | <b>Viscosity (cSt)</b>                         | Not Available  |
| <b>Initial boiling point and boiling range (°C)</b> | 34.6                                                                                                                                                                                                            | <b>Molecular weight (g/mol)</b>                | 74.12          |
| <b>Flash point (°C)</b>                             | -45                                                                                                                                                                                                             | <b>Taste</b>                                   | Not Available  |
| <b>Evaporation rate</b>                             | 37.5 (BuAc=1)                                                                                                                                                                                                   | <b>Explosive properties</b>                    | Not Available  |
| <b>Flammability</b>                                 | HIGHLY FLAMMABLE.                                                                                                                                                                                               | <b>Oxidising properties</b>                    | Not Available  |
| <b>Upper Explosive Limit (%)</b>                    | 48                                                                                                                                                                                                              | <b>Surface Tension (dyn/cm or mN/m)</b>        | Not Available  |
| <b>Lower Explosive Limit (%)</b>                    | 1.85                                                                                                                                                                                                            | <b>Volatile Component (%vol)</b>               | 100            |
| <b>Vapour pressure (kPa)</b>                        | 58.64 at 20 C.                                                                                                                                                                                                  | <b>Gas group</b>                               | IIB            |
| <b>Solubility in water (g/L)</b>                    | Partly miscible                                                                                                                                                                                                 | <b>pH as a solution (1%)</b>                   | Not Applicable |
| <b>Vapour density (Air = 1)</b>                     | 2.55                                                                                                                                                                                                            | <b>VOC g/L</b>                                 | 679.01         |

## SECTION 10 STABILITY AND REACTIVITY

|                                           |                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reactivity</b>                         | See section 7                                                                                                                                                                                                                                                                                                  |
| <b>Chemical stability</b>                 | Presence of a stabilising inhibitor prevents/retards peroxide formation. <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> </ul>  Loss or depletion of inhibitor. |
| <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> | Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.<br>Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.<br>There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.<br>When inhaled, diethyl ether can cause rapid loss of consciousness, and with continuous exposure, respiratory muscle weakness, stoppage of breathing and death. At lower doses, mild nasal irritation occurs, and at higher doses, dizziness may be experienced. Minor vapour exposure may produce headache, nausea and vomiting. There may be a severe fall in blood pressure, throat spasm, convulsions, reduced blood flow to the kidneys and liver damage.<br>Following inhalation, ethers cause lethargy and stupor. Inhaling lower alkyl ethers results in headache, dizziness, weakness, blurred vision, seizures and possible coma. |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. The vapour may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Ingestion</b>    | Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.<br>Ingestion of alkyl ethers may produce stupor, blurred vision, headache, dizziness and irritation of the nose and throat. Respiratory distress and asphyxia may result.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Skin Contact</b> | Repeated exposure may cause skin cracking, flaking or drying following normal handling and use.<br>Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.<br>Alkyl ethers may defat and dehydrate the skin producing dermatoses. Absorption may produce headache, dizziness, and central nervous system depression.<br>Open cuts, abraded or irritated skin should not be exposed to this material<br>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.<br>The material may cause severe inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.                                                                                                                                                             |
| <b>Eye</b>          | Eye contact with alkyl ethers (vapour or liquid) may produce irritation, redness and tears.<br>There is some evidence that 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>      | Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following.<br>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.<br>There is limited evidence that, skin contact with this product is more likely to cause a sensitisation reaction in some persons compared to the general population.<br>Diethyl ether is used as a medical anaesthetic. While medically "safe", the hazard is due to its high volatility, potential of vapour explosion and fire. Abuse of ether by repeated inhalation may present like chronic alcoholism. Repeated exposures by workers produced loss of appetite, exhaustion, headache, sleepiness, dizziness, excitation and psychic disturbances, protein in the urine, and increased viscosity of the blood.<br>Chronic exposure to alkyl ethers may result in loss of appetite, excessive thirst, fatigue, and weight loss.<br>Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS] |

|                                                                                              |                                                                                                                 |                                                                     |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>Diethyl ether AnalR<br/>NORMAPUR® ACS, ISO,<br/>Reag. Ph. Eur. analytical<br/>reagent</b> | <b>TOXICITY</b>                                                                                                 | <b>IRRITATION</b>                                                   |
|                                                                                              | Inhalation (mouse) LC50: 3866.16229478887 mg/L/30M <sup>[2]</sup><br>Oral (rat) LD50: 1215 mg/kg <sup>[2]</sup> | Eye (rabbit): 100 mg - moderate<br>Skin (rabbit):360 mg (open)-mild |
| <b>hydroquinone</b>                                                                          | <b>TOXICITY</b>                                                                                                 | <b>IRRITATION</b>                                                   |
|                                                                                              | Dermal (rabbit) LD50: >2000 mg/kg <sup>[2]</sup><br>Oral (rat) LD50: 302 mg/kg <sup>[2]</sup>                   | Skin (human): 2% - mild<br>Skin (human): 5% - SEVERE                |

**Legend:** 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.\* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>HYDROQUINONE</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.<br>Animal testing shows that hydroquinone is rapidly and extensively absorbed from the gut and lung. Absorption via the skin is slow, but may be accelerated with alcohols. Hydroquinone distributes rapidly and widely among tissues. It is rapidly excreted from the body, mostly via the urine.<br>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>DIETHYL ETHER ANALAR<br/>NORMAPUR® ACS, ISO,<br/>REAG. PH. EUR.<br/>ANALYTICAL REAGENT &amp;<br/>HYDROQUINONE</b> | The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration. |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                          |   |                                 |   |
|------------------------------------------|---|---------------------------------|---|
| <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>        | ⊗ |

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

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

| <b>Diethyl ether AnalR<br/>NORMAPUR® ACS, ISO,<br/>Reag. Ph. Eur. analytical<br/>reagent</b> | ENDPOINT | TEST DURATION (HR) | SPECIES   | VALUE       | SOURCE   |
|----------------------------------------------------------------------------------------------|----------|--------------------|-----------|-------------|----------|
|                                                                                              | LC50     | 96                 |           | Fish        | 2560mg/L |
| EC50                                                                                         | 48       |                    | Crustacea | 1378.63mg/L | 5        |

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

| hydroquinone | ENDPOINT | TEST DURATION (HR) | SPECIES                       | VALUE      | SOURCE |
|--------------|----------|--------------------|-------------------------------|------------|--------|
|              | LC50     | 96                 | Fish                          | 0.044mg/L  | 4      |
|              | EC50     | 48                 | Crustacea                     | 0.061mg/L  | 2      |
|              | EC50     | 72                 | Algae or other aquatic plants | <0.033mg/L | 2      |
|              | BCF      | 24                 | Algae or other aquatic plants | 0.05mg/L   | 4      |
|              | NOEC     | 72                 | Algae or other aquatic plants | 0.0015mg/L | 2      |

**Legend:** Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Harmful to aquatic organisms.

Most ethers are very resistant to hydrolysis, and the rate of cleavage of the carbon-oxygen bond by abiotic processes is expected to be insignificant.

Direct photolysis will not be an important removal process since aliphatic ethers do not absorb light at wavelengths >290 nm

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

|log Kow : 0.77-0.89|Koc : 11-73|Half-life (hr) air : 29|Half-life (hr) H2O surface water : 3.1-36|Henry's atm m3 /mol: 0.00128|BOD 5 : 0.03|ThOD : 2.6|BCF : 1.3-2.8|Fish LD50 (24 h): 7000 mg/L|Bioaccumulation : unlikely|processes Abiotic: photox,RxnOH\*

**Persistence and degradability**

| Ingredient                                                                 | Persistence: Water/Soil | Persistence: Air |
|----------------------------------------------------------------------------|-------------------------|------------------|
| Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent | LOW                     | LOW              |
| hydroquinone                                                               | LOW                     | LOW              |

**Bioaccumulative potential**

| Ingredient                                                                 | Bioaccumulation |
|----------------------------------------------------------------------------|-----------------|
| Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent | LOW (BCF = 9.1) |
| hydroquinone                                                               | LOW (BCF = 65)  |

**Mobility in soil**

| Ingredient                                                                 | Mobility          |
|----------------------------------------------------------------------------|-------------------|
| Diethyl ether AnalAR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent | LOW (KOC = 4.395) |
| hydroquinone                                                               | LOW (KOC = 434)   |

**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> </ul> <p>Otherwise:</p> <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> </ul> <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> <li>▶ Reduction</li> <li>▶ Reuse</li> <li>▶ Recycling</li> <li>▶ Disposal (if all else fails)</li> </ul> <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></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>▶ Recycle wherever possible.</li> <li>▶ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.</li> <li>▶ Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material).</li> <li>▶ Decontaminate empty containers.</li> </ul> |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**SECTION 14 TRANSPORT INFORMATION**

**Labels Required**

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

|                         |                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------|
|                         |  |
| <b>Marine Pollutant</b> | NO                                                                                |
| <b>HAZCHEM</b>          | •3YE                                                                              |

Land transport (ADG)

|                                     |                                                             |
|-------------------------------------|-------------------------------------------------------------|
| <b>UN number</b>                    | 1155*                                                       |
| <b>UN proper shipping name</b>      | DIETHYL ETHER (ETHYL ETHER)                                 |
| <b>Transport hazard class(es)</b>   | Class : 3<br>Subrisk : Not Applicable                       |
| <b>Packing group</b>                | I                                                           |
| <b>Environmental hazard</b>         | Not Applicable                                              |
| <b>Special precautions for user</b> | Special provisions : Not Applicable<br>Limited quantity : 0 |

Air transport (ICAO-IATA / DGR)

|                                     |                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UN number</b>                    | 1155*                                                                                                                                                                                                                                                                                                                                                         |
| <b>UN proper shipping name</b>      | Diethyl ether; Ethyl ether                                                                                                                                                                                                                                                                                                                                    |
| <b>Transport hazard class(es)</b>   | ICAO/IATA Class : 3<br>ICAO / IATA Subrisk : Not Applicable<br>ERG Code : 3AH                                                                                                                                                                                                                                                                                 |
| <b>Packing group</b>                | I                                                                                                                                                                                                                                                                                                                                                             |
| <b>Environmental hazard</b>         | Not Applicable                                                                                                                                                                                                                                                                                                                                                |
| <b>Special precautions for user</b> | Special provisions : Not Applicable<br>Cargo Only Packing Instructions : 361<br>Cargo Only Maximum Qty / Pack : 30 L<br>Passenger and Cargo Packing Instructions : 351<br>Passenger and Cargo Maximum Qty / Pack : 1 L<br>Passenger and Cargo Limited Quantity Packing Instructions : Forbidden<br>Passenger and Cargo Limited Maximum Qty / Pack : Forbidden |

Sea transport (IMDG-Code / GGVSee)

|                                     |                                                                                         |
|-------------------------------------|-----------------------------------------------------------------------------------------|
| <b>UN number</b>                    | 1155*                                                                                   |
| <b>UN proper shipping name</b>      | DIETHYL ETHER (ETHYL ETHER)                                                             |
| <b>Transport hazard class(es)</b>   | IMDG Class : 3<br>IMDG Subrisk : Not Applicable                                         |
| <b>Packing group</b>                | I                                                                                       |
| <b>Environmental hazard</b>         | Not Applicable                                                                          |
| <b>Special precautions for user</b> | EMS Number : F-E , S-D<br>Special provisions : Not Applicable<br>Limited Quantities : 0 |

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

| Source                                                                    | Product name  | Pollution Category | Ship Type |
|---------------------------------------------------------------------------|---------------|--------------------|-----------|
| IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk | Diethyl ether | Z                  | 2         |

SECTION 15 REGULATORY INFORMATION

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

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT(60-29-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

|                                                                        |                                                                                               |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Australia Exposure Standards                                           | Australia Inventory of Chemical Substances (AICS)                                             |
| Australia Hazardous Substances Information System - Consolidated Lists | International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs |

DIETHYL ETHER ANALAR NORMAPUR® ACS, ISO, REAG. PH. EUR. ANALYTICAL REAGENT

**HYDROQUINONE(123-31-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Australia Exposure Standards

Australia Hazardous Substances Information System - Consolidated Lists

Australia Inventory of Chemical Substances (AICS)

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

| National Inventory            | Status                                                                                                                                                                                   |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Australia - AICS              | Y                                                                                                                                                                                        |
| Canada - DSL                  | Y                                                                                                                                                                                        |
| Canada - NDSL                 | N (Diethyl ether AnalaR NORMAPUR® ACS, ISO, Reag. Ph. Eur. analytical reagent; hydroquinone)                                                                                             |
| China - IECSC                 | Y                                                                                                                                                                                        |
| Europe - EINEC / ELINCS / NLP | Y                                                                                                                                                                                        |
| Japan - ENCS                  | Y                                                                                                                                                                                        |
| Korea - KECI                  | Y                                                                                                                                                                                        |
| New Zealand - NZIoC           | Y                                                                                                                                                                                        |
| Philippines - PICCS           | Y                                                                                                                                                                                        |
| USA - TSCA                    | Y                                                                                                                                                                                        |
| <b>Legend:</b>                | Y = All ingredients are on the inventory<br>N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets) |

**SECTION 16 OTHER INFORMATION**

**Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

**Definitions and abbreviations**

PC—TWA: Permissible Concentration-Time Weighted Average  
 PC—STEL: Permissible Concentration-Short Term Exposure Limit  
 IARC: International Agency for Research on Cancer  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 STEL: Short Term Exposure Limit  
 TEEL: Temporary Emergency Exposure Limit.  
 IDLH: Immediately Dangerous to Life or Health Concentrations  
 OSF: Odour Safety Factor  
 NOAEL :No Observed Adverse Effect Level  
 LOAEL: Lowest Observed Adverse Effect Level  
 TLV: Threshold Limit Value  
 LOD: Limit Of Detection  
 OTV: Odour Threshold Value  
 BCF: BioConcentration Factors  
 BEI: Biological Exposure Index

This document is copyright.

Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH.

TEL (+61 3) 9572 4700.