

## MATERIAL SAFETY DATA SHEET

according to according to Work Health and Safety Regulations (Hazardous Chemicals) 2023 and ADG requirements

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

#### 1.1. Product identifier

Product form : Mixture  
Product name : HYDRAGUARD  
Product code : 47-2-2-HYDRAGUARD

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

##### 1.2.1. Relevant identified uses

Industrial/Professional use spec : Industrial  
For professional use only  
Use of the substance/mixture : One component waterproofing and protection elastomeric material, based on polyurethane resin for the building industry

##### 1.2.2. Uses advised against

Restrictions on use : The product is not recommended for any industrial, professional or consumer use other than the identified uses above

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

POLYBIT WATERPROOFING SYSTEMS  
3A Bellfrog Street, Greenacre NSW 2190  
Sydney, Australia  
T 02 9131 6224

#### 1.4. Emergency telephone number

T +61 414 923 809

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

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

##### Poisons Schedule

Not Applicable

##### Classification <sup>[1]</sup>

Flammable Liquids Category 4, Aspiration Hazard Category 1, Sensitisation (Skin) Category 1, Sensitisation (Respiratory) Category 1, Carcinogenicity Category 1B

Legend: 1. Classification drawn from HCIS; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

#### 2.2. Label elements

##### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms [CLP]



Hazard statement(s)

H227 : Combustible liquid.  
H304 : May be fatal if swallowed and enters airways.  
H317 : May cause an allergic skin reaction.  
H334 : May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
H350 : May cause cancer by inhalation.  
P101 : If medical advice is needed, have product container or label at hand.  
P102 : Keep out of reach of children.  
P103 : Read carefully and follow all instructions.

#### Precautionary statement(s) Prevention

P201	: Obtain special instructions before use.
P210	: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	: Avoid breathing mist/vapours/spray.
P280	: Wear protective gloves and protective clothing.
P284	: [In case of inadequate ventilation] wear respiratory protection.
P272	: Contaminated work clothing should not be allowed out of the workplace.

#### Precautionary statement(s) Response

P301+P310	: IF SWALLOWED: Immediately call a POISON CENTER/doctor/physician/first aider.
P331	: DO NOT induce vomiting.
P304+P340	: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313	: IF exposed or concerned: Get medical advice/ attention.
P342+P311	: IF experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician/ first aider.
P370+P378	: In case of fire: Use alcohol resistant foam or normal protein foam to extinguish.
P302+P352	: IF ON SKIN: Wash with plenty of water.
P333+P313	: IF skin irritation or rash occurs: Get medical advice/attention.
P362+P364	: Take off contaminated clothing and wash it before reuse.

#### Precautionary statement(s) Storage

P403	: Store in a well-ventilated place.
P405	: Store locked up.

#### Precautionary statement(s) Disposal

P501	: Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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## SECTION 3: Composition/information on ingredients

### 3.1. Substances

See section below for composition of Mixtures

CAS No	Weight %	Name
68515-48-0	10-30	diisononyl phthalate
64742-95-6	<10	naphtha petroleum, light aromatic solvent
1330-20-7	<5	xylene
101-68-8	<1	4,4'-diphenylmethane diisocyanate (MDI)
98-82-8	<1	cumene
Not Available	to 100	All other substances - non-hazardous

Legend: 1. Classification drawn from HCIS; 2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; \* EU IOELVs available

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

#### Eye Contact

If this product comes in contact with eyes:

- Wash out immediately with water.
- If irritation continues, seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

#### Skin Contact

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

#### Inhalation

- If fumes, aerosols or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

Following uptake by inhalation, move person to an area free from risk of further exposure. Oxygen or artificial respiration should be administered as needed. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Treatment is essentially symptomatic. A physician should be consulted.

## Ingestion

- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.
- Avoid giving milk or oils.
- Avoid giving alcohol.

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

Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

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

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

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.  
Unsuitable extinguishing media : Do not use a heavy water stream.

### 5.2. Special hazards arising from the substance or mixture

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

### 5.3. Advice for firefighters

#### Firefighting

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

#### Fire/Explosion Hazard

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Fire/Explosion Hazard (cont.)

Combustion products include:  
carbon dioxide (CO<sub>2</sub>)  
isocyanates  
and minor amounts of  
hydrogen cyanide  
nitrogen oxides (NO<sub>x</sub>)  
other pyrolysis products typical of burning organic material.  
May emit poisonous fumes.  
May emit corrosive fumes.

HAZCHEM

Not Applicable

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

see section 8

#### 6.1.1. Environmental precautions

see section 12

### 6.2. Methods and material for containment and cleaning up

Minor Spills

- : Environmental hazard - contain spillage.
- Remove all ignition sources.
  - Clean up all spills immediately.
  - Avoid breathing vapours and contact with skin and eyes.
  - Control personal contact with the substance, by using protective equipment.
  - Contain and absorb spill with sand, earth, inert material or vermiculite.
  - Wipe up.
  - Place in a suitable, labelled container for waste disposal.

Major Spills

- : Environmental hazard - contain spillage.  
Moderate hazard.
- Clear area of personnel and move upwind.
  - Alert Fire Brigade and tell them location and nature of hazard.
  - Wear breathing apparatus plus protective gloves.
  - Prevent, by any means available, spillage from entering drains or water course.
  - No smoking, naked lights or ignition sources.
  - Increase ventilation.
  - Stop leak if safe to do so.
  - Contain spill with sand, earth or vermiculite.
  - Collect recoverable product into labelled containers for recycling.
  - Absorb remaining product with sand, earth or vermiculite.
  - Collect solid residues and seal in labelled drums for disposal.
  - Wash area and prevent runoff into drains.
  - If contamination of drains or waterways occurs, advise emergency services.

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

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

safe handling

- : The conductivity of this material may make it a static accumulator. A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m. Whether a liquid is nonconductive or semi-conductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid.
- Containers, even those that have been emptied, may contain explosive vapours.
  - DO NOT cut, drill, grind, weld or perform similar operations on or near containers.
- Product is moisture sensitive; handle under a dry, inert gas.  
Nitrogen with less than 5 ppm each of moisture and oxygen is recommended
- Electrostatic discharge may be generated during pumping - this may result in fire.
  - Ensure electrical continuity by bonding and grounding (earthing) all equipment.

safe handling (cont.)

- Restrict line velocity during pumping in order to avoid generation of electrostatic discharge ( $\leq 1$  m/sec until fill pipe submerged to twice its diameter, then  $\leq 7$  m/sec).
- Avoid splash filling.
- Do NOT use compressed air for filling, discharging or handling operations.
- Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes.
- Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
- Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge ( $\leq 1$  m/s until fill pipe submerged to twice its diameter, then  $\leq 7$  m/s). Avoid splash filling.
- Do NOT use compressed air for filling, discharging, or handling operations
  - Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs.
  - Use in a well-ventilated area.
  - Prevent concentration in hollows and sumps.
  - DO NOT enter confined spaces until atmosphere has been checked.
  - Avoid smoking, naked lights or ignition sources.
  - Avoid contact with incompatible materials.
  - When handling, DO NOT eat, drink or smoke.
  - Keep containers securely sealed when not in use.
  - Avoid physical damage to containers.
  - Always wash hands with soap and water after handling.
  - Work clothes should be laundered separately.
  - Use good occupational work practice.
  - Observe manufacturer's storage and handling recommendations contained within this SDS.
  - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
  - DO NOT allow clothing wet with material to stay in contact with skin

Other information

- : Consider storage under inert gas
  - Store in original containers.
  - Keep containers securely sealed.
  - No smoking, naked lights or ignition sources.
  - Store in a cool, dry, well-ventilated area.
  - Store away from incompatible materials and foodstuff containers.
  - Protect containers against physical damage and check regularly for leaks.
  - Observe manufacturer's storage and handling recommendations contained within this SDS.

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

Suitable container

- :
  - Metal can or drum
  - Packaging as recommended by manufacturer.
  - Check all containers are clearly labelled and free from leaks.

Storage incompatibility

- : Phthalates:
  - react with strong acids, strong oxidisers, permanganates and nitrates
  - attack some form of plastics
- Xylenes:
  - may ignite or explode in contact with strong oxidisers, 1,3-dichloro-5,5-dimethylhydantoin, uranium fluoride
  - attack some plastics, rubber and coatings
  - may generate electrostatic charges on flow or agitation due to low conductivity.
  - Vigorous reactions, sometimes amounting to explosions, can result from the contact between aromatic rings and strong oxidising agents.
  - Aromatics can react exothermically with bases and with diazo compounds.

## Storage incompatibility (cont.)

For alkyl aromatics:

The alkyl side chain of aromatic rings can undergo oxidation by several mechanisms. The most common and dominant one is the attack by oxidation at benzylic carbon as the intermediate formed is stabilised by resonance structure of the ring.

- Following reaction with oxygen and under the influence of sunlight, a hydroperoxide at the alpha-position to the aromatic ring, is the primary oxidation product formed (provided a hydrogen atom is initially available at this position) - this product is often short-lived but may be stable dependent on the nature of the aromatic substitution; a secondary C-H bond is more easily attacked than a primary C-H bond whilst a tertiary C-H bond is even more susceptible to attack by oxygen
- Monoalkylbenzenes may subsequently form monocarboxylic acids; alkyl naphthalenes mainly produce the corresponding naphthalene carboxylic acids.
- Oxidation in the presence of transition metal salts not only accelerates but also selectively decomposes the hydroperoxides.
- Hock-rearrangement by the influence of strong acids converts the hydroperoxides to hemiacetals. Peresters formed from the hydroperoxides undergo Criegee rearrangement easily.
- Alkali metals accelerate the oxidation while CO<sub>2</sub> as co-oxidant enhances the selectivity.
- Microwave conditions give improved yields of the oxidation products.
- Photo-oxidation products may occur following reaction with hydroxyl radicals and NO<sub>x</sub> - these may be components of photochemical smogs.

Oxidation of Alkylaromatics: T.S.S Rao and Shubhra Awasthi: E-Journal of Chemistry Vol 4, No. 1, pp 1-13 January 2007

- NOTE: May develop pressure in containers; open carefully. Vent periodically.
- Segregate from alcohol, water.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1. OCCUPATIONAL EXPOSURE LIMITS (OEL)

##### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	xylene	Xylene (o-, m-, p- isomers)	80 ppm / 350 mg/m <sup>3</sup>	655 mg/m <sup>3</sup> / 150 ppm	Not Available	Not Available
Australia Exposure Standards	4,4'-diphenylmethane diisocyanate (MDI)	Methylene bisphenyl isocyanate (MDI)	Not Available	Not Available	Not Available	Not Available
Australia Exposure Standards	cumene	cumene	25 ppm / 125 mg/m <sup>3</sup>	375 mg/m <sup>3</sup> / 75 ppm	Not Available	Not Available

#### 8.1.2. Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
naphtha petroleum, light aromatic solvent	1,200 mg/m <sup>3</sup>	6,700 mg/m <sup>3</sup>	40,000 mg/m <sup>3</sup>
xylene	Not Available	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	0.45 mg/m <sup>3</sup>	Not Available	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	29 mg/m <sup>3</sup>	40 mg/m <sup>3</sup>	240 mg/m <sup>3</sup>
cumene	Not Available	Not Available	Not Available

### 8.1.2. Emergency Limits (continued)

Ingredient	Original IDLH	Revised IDLH
diisononyl phthalate	Not Available	Not Available
naphtha petroleum, light aromatic solvent	Not Available	Not Available
xylene	900 ppm	Not Available
4,4'-diphenylmethane diisocyanate (MDI)	75 mg/m <sup>3</sup>	Not Available
cumene	Not Available	Not Available

### 8.1.3. Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
diisononyl phthalate	E	⩽ 0.1 ppm
naphtha petroleum, light aromatic solvent	E	⩽ 0.1 ppm

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

### 8.2. Exposure controls

Appropriate engineering controls :

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.

Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations.

Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying 'escape' velocities which, in turn, determine the 'capture velocities' of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

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

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

Individual protection measures, such as personal protective equipment :



Eye and face protection :

- Safety glasses with side shields.
- Chemical goggles. [AS/NZS 1337.1, EN166 or national equivalent]
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

Skin protection :

See Hand protection below

Hands/feet protection :

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber

**NOTE:**

- 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.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

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.

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.

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
- Contaminated gloves should be replaced.

As defined in ASTM F-739-96 in any application, gloves are rated as:

- Excellent when breakthrough time → 480 min
- Good when breakthrough time → 20 min
- Fair when breakthrough time ← 20 min
- Poor when glove material degrades

For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.

Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

- Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.
- Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Body protection :

See Other protection below

Other protection :

- Overalls.
- P.V.C apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Appearance	: Light grey liquid
Physical state	: Liquid
Odour	: Not Available
Odour threshold	: Not Available
pH (as supplied)	: Not Available
Melting point / freezing point (°C)	: Not Available
Initial boiling point and boiling range (°C)	: Not Available
Flash point (°C)	: 61-62
Evaporation rate	: Not Available
Flammability	: Combustible.
Upper Explosive Limit (%)	: Not Available
Lower Explosive Limit (%)	: Not Available
Vapour pressure (kPa)	: Not Available
Solubility in water	: Reacts
Vapour density (Air = 1)	: Not Available

## 9.1. Information on basic physical and chemical properties (continued)

Relative density (Water = 1)	: Not Available
Partition coefficient n-octanol / water	: Not Available
Auto-ignition temperature (°C)	: Not Available
Decomposition temperature (°C)	: Not Available
Viscosity (cSt)	: Not Available
Molecular weight (g/mol)	: Not Available
Taste	: Not Available
Explosive properties	: Not Available
Oxidising properties	: Not Available
Surface Tension (dyn/cm or mN/m)	: Not Available
Volatile Component (%vol)	: Not Available
Gas group	: Not Available
pH as a solution (1%)	: Not Available
VOC g/L	: Not Available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

See section 7

### 10.2. Chemical stability

- Unstable in the presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

### 10.3. Possibility of hazardous reactions

See section 7

### 10.4. Conditions to avoid

See section 7

### 10.5. Incompatible materials

See section 7

### 10.6. Hazardous decomposition products

See section 5

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Inhaled

- : The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.  
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.  
Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.  
Central nervous system (CNS) depression may include general discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal.  
On exposure to mixed trimethylbenzenes, some people may become nervous, tensed, anxious and have difficult breathing. There may be a reduction red blood cells and bleeding abnormalities. There may also be drowsiness.  
The acute toxicity of inhaled alkylbenzene is best described by central nervous system depression. These compounds may also act as general anaesthetics. Whole body symptoms of poisoning include light-headedness, nervousness, apprehension, a feeling of well-being, confusion, dizziness, drowsiness, ringing in the ears, blurred or double vision, vomiting and sensations of heat, cold or numbness, twitching, tremors, convulsions, unconsciousness, depression of breathing, and arrest. Heart stoppage may result from cardiovascular collapse. A slow heart rate and low blood pressure may also occur.

### 11.1. Information on toxicological effects (continued)

- Inhaled : Alkylbenzenes are not generally toxic except at high levels of exposure. Their breakdown products have low toxicity and are easily eliminated from the body. Headache, fatigue, tiredness, irritability and digestive disturbances (nausea, loss of appetite and bloating) are the most common symptoms of xylene overexposure. Injury to the heart, liver, kidneys and nervous system has also been noted amongst workers.  
Xylene is a central nervous system depressant.
- Ingestion : Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733)  
The material has NOT been classified by EC Directives or other classification systems as 'harmful by ingestion'. This is because of the lack of corroborating animal or human evidence.  
The toxicity of phthalates is not excessive due to slow oral absorption and metabolism. Absorption is affected by fat in the diet. Repeated doses can cause cumulative toxic effects, and symptoms include an enlarged liver which often reverses if exposure is maintained. Carbohydrate metabolism is disrupted, and cholesterol and triglyceride levels in the blood falls. In rats, there is also strong evidence of withering of the testicles. Some phthalates can increase the effects of antibiotics, thiamine (vitamin B1) and sulfonamides.
- Skin Contact : This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.  
Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
- Eye : Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).
- Chronic : Studies show that inhaling this substance for over a long period (e.g. in an occupational setting) may increase the risk of cancer. There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. Ample evidence exists from experimentation that reduced human fertility is directly caused by exposure to the material.  
Exposure to phthalates over years leads to pain, numbness and spasms in the hands and feet. Many people have developed multiple disorders in the nervous system and the balancing system.  
Women exposed to xylene in the first 3 months of pregnancy showed a slightly increased risk of miscarriage and birth defects. Evaluation of workers chronically exposed to xylene has demonstrated lack of genetic toxicity.

### POLYBIT HYDRAGUARD

TOXICITY	IRRITATION
Not Available	Not Available

### diisononyl phthalate

TOXICITY	IRRITATION
Dermal (rabbit) LD50: →3160 mg/kg <sup>[2]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
Inhalation (Rat) LC50: →4.4 mg/l4h <sup>[1]</sup>	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>
Oral (Rat) LD50: →10000 mg/kg <sup>[2]</sup>	

#### naphtha petroleum, light aromatic solvent

TOXICITY	IRRITATION
Dermal (rabbit) LD50: →1900 mg/kg <sup>[1]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
Inhalation (Rat) LC50: →4.42 mg/L4h <sup>[1]</sup>	Skin: adverse effect observed (irritating) <sup>[1]</sup>
Oral (Rat) LD50: →4500 mg/kg <sup>[1]</sup>	

#### xylene

TOXICITY	IRRITATION
Dermal (rabbit) LD50: →1700 mg/kg <sup>[2]</sup>	Eye (human): 200 ppm irritant
Inhalation (Rat) LC50: 5000 ppm4h <sup>[2]</sup>	Eye (rabbit): 5 mg/24h SEVERE
Oral (Mouse) LD50; 2119 mg/kg <sup>[2]</sup>	Eye (rabbit): 87 mg mild
	Eye: adverse effect observed (irritating) <sup>[1]</sup>
	Skin (rabbit):500 mg/24h moderate
	Skin: adverse effect observed (irritating) <sup>[1]</sup>

#### 4,4'-diphenylmethane diisocyanate (MDI)

TOXICITY	IRRITATION
Dermal (rabbit) LD50: →6200 mg/kg <sup>[2]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
Inhalation (Rat) LC50: 0.368 mg/L4h <sup>[1]</sup>	Skin (rabbit): 500 mg /24 hours Dermal Sensitiser *Respiratory Sensitiser (g.pig) *[* = Bayer CCINFO 2133615]
Oral (Mouse) LD50; 2200 mg/kg <sup>[2]</sup>	Skin: adverse effect observed (irritating) <sup>[1]</sup>

#### cumene

TOXICITY	IRRITATION
Dermal (rabbit) LD50: 2000 mg/kg <sup>[2]</sup>	Eye (rabbit): 500 mg/24h mild
Inhalation (Rat) LC50: 39 mg/L4h <sup>[2]</sup>	Eye (rabbit): 86 mg mild
Oral (Rat) LD50: 1400 mg/kg <sup>[2]</sup>	Eye: no adverse effect observed (not irritating) <sup>[1]</sup>
	Skin (rabbit): 10 mg/24h mild
	Skin (rabbit):100 mg/24h moderate
	Skin: adverse effect observed (not irritating) <sup>[1]</sup>

#### 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

#### POLYBIT HYDRAGUARD

Data demonstrate that during inhalation exposure, aromatic hydrocarbons undergo substantial partitioning into adipose tissues. Following cessation of exposure, the level of aromatic hydrocarbons in body fats rapidly declines. Thus, the aromatic hydrocarbons are unlikely to bioaccumulate in the body. Selective partitioning of the aromatic hydrocarbons into the non-adipose tissues is unlikely. No data is available regarding distribution following dermal absorption. However, distribution following this route of exposure is likely to resemble the pattern occurring with inhalation exposure.

Aromatics hydrocarbons may undergo several different Phase I dealkylation, hydroxylation and oxidation reactions which may or may not be followed by Phase II conjugation to glycine, sulfation or glucuronidation. However, the major predominant biotransformation pathway is typical of that of the alkylbenzenes and consists of: (1) oxidation of one of the alkyl groups to an alcohol moiety; (2) oxidation of the hydroxyl group to a carboxylic acid; (3) the carboxylic acid is then conjugated with glycine to form a hippuric acid. The minor metabolites can be expected to consist of a complex mixture of isomeric triphenols, the sulfate

and glucuronide conjugates of dimethylbenzyl alcohols, dimethylbenzoic acids and dimethylhippuric acids. Consistent with the low propensity for bioaccumulation of aromatic hydrocarbons, these substances are likely to be significant inducers of their own metabolism.

The predominant route of excretion of aromatic hydrocarbons following inhalation exposure involves either exhalation of the unmetabolized parent compound, or urinary excretion of its metabolites. When oral administration occurs, there is little exhalation of unmetabolized these hydrocarbons, presumably due to the first pass effect in the liver. Under these circumstances, urinary excretion of metabolites is the dominant route of excretion.

#### DIISONONYL PHTHALATE

[Huls] The effects of DINP on fertility-related parameters such as reduced testosterone content and production and altered reproductive organ weights (with or without histopathologies) have been demonstrated in rats. Although quantitatively being less potent, DINP has exhibited adverse effects on the male reproductive system and sexual differentiation during development in a number of rodent studies (e.g. increased nipple retention, testicular pathology and decreased AGD/AGI in male offspring), which are components of the antiandrogenic pattern observed with diethylethyl phthalate (DEHP) (a known reproductive toxicant). Foetal expression of genes involved in androgen synthesis such as StAR and Cyp11a were also reduced. There was also a report of increased gene expression levels of Insl3 (a foetal Leydig cell product critical for testis descent) that may infer the impaired testicular steroidogenesis following exposure to DINP at high doses (e.g. = 750 mg/kg bw/d). Reduced Insl3 was also reported in numerous studies with DEHP. Considering the chemical composition of DINP, which is represented as mixed phthalates with side-chains made up of 5?10% methylethylhexyl, limited evidence of the toxicological properties of transitional phthalates may be expected at high doses of DINP tested. The reduced pup weight was observed at approximately 100 mg/kg bw/d in both sexes, both in one- and two-generation reproductive studies in rats, in the absence of overt maternal toxicity. The pup weight reduction was also sustained and not considered solely related to low birth weight. In a post-natal toxicity study, reduced pup weight was also reduced at = 250 mg/kg bw/d. Therefore, this adverse effect of DINP is assessed as the most sensitive endpoint on offspring development. Overall, the available human data do not provide sufficient evidence for a causal relationship between exposure to DINP and adverse health effects in humans. There is also insufficient information to examine the mode of action of DINP on male reproductive tract development and sexual function in comparison with transitional phthalates. However, elements of the plausible mode of action for DINP effects on the male reproductive system, offspring growth and sexual differentiation are considered likely to be parallel in rats and humans if the exposure to DINP is high and within a critical window of development. Therefore, the effects observed in animal studies are regarded as relevant to a human risk assessment.

#### High Molecular Weight Phthalate Esters (HMWPEs) Category

The HMWPE group includes chemically similar substances produced from alcohols. These substances have been demonstrated to have few biological effects. They demonstrate minimal acute toxicity, with effect on the liver and kidney at high doses. They also cause reproductive and developmental toxicity, also, liver cancer. They are readily metabolised and excreted primarily via the urine. Repeated doses may cause liver and kidney damage, although the relevance to human health is questionable.

#### NAPHTHA PETROLEUM, LIGHT AROMATIC SOLVENT

\* [Devoe] .

For C9 aromatics (typically trimethylbenzenes – TMBs)

Acute toxicity: Animal testing shows that semi-lethal concentrations and doses vary amongst this group. The semilethal concentrations for inhalation range from 6000 to 10000 mg/cubic metre for C9 aromatic naphtha and 18000-24000 mg/cubic metre for 1,2,4- and 1,3,5-TMB, respectively.

Irritation and sensitization: Results from animal testing indicate that C9 aromatic hydrocarbon solvents are mildly to moderately irritating to the skin, minimally irritating to the eye, and have the potential to irritate the airway and cause depression of breathing rate. There is no evidence that it sensitizes skin.

Repeated dose toxicity: Animal studies show that chronic inhalation toxicity for C9 aromatic hydrocarbon solvents is slight. Similarly, oral exposure does not appear to pose a high toxicity hazard for pure trimethylbenzene isomers.

Mutation-causing ability: No evidence of mutation-causing ability and genetic toxicity was found in animal and laboratory testing.

Reproductive and developmental toxicity: No definitive effects on reproduction were seen, although reduction in weight in developing animals may be seen at concentrations that are toxic to the mother.

#### XYLENE

Reproductive effector in rats

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

#### 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI)

Inhalation (human) TLo: 0.13 ppm/30 mins Eye (rabbit): 0.10 mg moderate

Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.

Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema.

Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Aromatic and aliphatic diisocyanates may cause airway toxicity and skin sensitization. Monomers and prepolymers exhibit similar respiratory effect. Of the several members of diisocyanates tested on experimental animals by inhalation and oral exposure, some caused cancer while others produced a harmless outcome. This group of compounds has therefore been classified as cancer-causing.

#### **CUMENE**

Cumene is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals. Cumene caused tumours at several tissue sites, including lung and liver in mice and kidney in male rats. Several proposed mechanisms of carcinogenesis support the relevance to humans of lung and liver tumours in experimental animals. Specifically, there is evidence that humans and experimental animals metabolise cumene through similar metabolic pathways. There is also evidence that cumene is genotoxic in some tissues, based on findings of DNA damage in rodent lung and liver. Furthermore, mutations of the K-ras oncogene and p53 tumor-suppressor gene observed in cumene-induced lung tumours in mice, along with altered expression of many other genes, resemble molecular alterations found in human lung and other cancers. The relevance of the kidney tumors to cancer in humans is uncertain; there is evidence that a species-specific mechanism not relevant to humans contributes to their induction, but it is possible that other mechanisms relevant to humans, such as genotoxicity, may also contribute to kidney-tumour formation in male rats.

For aromatic terpenes: p-cymene and cumene have low toxic potential and are excreted in the urine. At very high doses in animal testing, inco-ordination, damage to the kidneys and lung inflammation, with decrease in thymus weight, occurred. This group of substances does not seem to cause cancer, genetic damage or developmental toxicity and has low potential for reproductive toxicity. Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [National Toxicology Program: U.S. Dep. of Health & Human Services 2002]

**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

#### **POLYBIT HYDRAGUARD & 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI)**

The following information refers to contact allergens as a group and may not be specific to this product.

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

#### **POLYBIT HYDRAGUARD & DIISONONYL PHTHALATE**

The material may produce peroxisome proliferation. Peroxisomes are single, membrane limited organelles in the cytoplasm that are found in the cells of animals, plants, fungi, and protozoa.

#### **POLYBIT HYDRAGUARD & NAPHTHA PETROLEUM, LIGHT AROMATIC SOLVENT**

For trimethylbenzenes:

Absorption of 1,2,4-trimethylbenzene occurs after exposure by swallowing, inhalation, or skin contact. In the workplace, inhalation and skin contact are the most important routes of absorption; whole-body toxic effects from skin absorption are unlikely to occur as the skin irritation caused by the chemical generally leads to quick removal. The substance is fat-soluble and may accumulate in fatty tissues. It is also bound to red blood cells in the bloodstream. It is excreted from the body both by exhalation and in the urine.

Acute toxicity: Direct contact with liquid 1,2,4-trimethylbenzene is irritating to the skin, and breathing the vapour is irritating to the airway, causing lung inflammation. Breathing high concentrations of the chemical vapour causes headache, fatigue and drowsiness. In humans, liquid 1,2,4-trimethylbenzene is irritating to the skin and inhalation of the vapour causes chemical pneumonitis. Direct skin contact causes dilation of blood vessels, redness and irritation.

Nervous system toxicity: 1,2,4-trimethylbenzene depresses the central nervous system. Exposure to solvent mixtures in the workplace containing the chemical causes headache, fatigue, nervousness and drowsiness.

Subacute/chronic toxicity: Long-term exposure to solvents containing 1,2,4-trimethylbenzene may cause nervousness, tension and inflammation of the bronchi. Painters that worked for several years with a solvent containing 50% 1,2,4-trimethylbenzene and 30% 1,3,5-trimethylbenzene showed nervousness, tension and anxiety, asthmatic bronchitis, anaemia and changes in blood clotting; blood effects may have been due to trace amounts of benzene. Animal testing showed that inhaling trimethylbenzene may alter blood counts, with reduction in lymphocytes and an increase in neutrophils.

Genetic toxicity: Animal testing does not show that the C9 fraction causes mutations or chromosomal aberrations.  
 Developmental / reproductive toxicity: Animal testing showed that the C9 fraction of 1,2,4-trimethylbenzene caused reproductive toxicity.

#### NAPHTHA PETROLEUM, LIGHT AROMATIC SOLVENT & 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI) & CUMENE

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

#### XYLENE & CUMENE

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

#### XYLENE & 4,4'-DIPHENYLMETHANE DIISOCYANATE (MDI)

The substance is classified by IARC as Group 3:  
 NOT classifiable as to its carcinogenicity to humans.  
 Evidence of carcinogenicity may be inadequate or limited in animal testing.

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

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

## SECTION 12: Ecological information

### 12.1. Toxicity

#### POLYBIT HYDRAGUARD

END POINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	N/A	N/A

#### diisononyl phthalate

END POINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
EC50	72h	Algae or other aquatic plants	→88mg/l	2
EC50	48h	Crustacea	→0.086mg/l	1
LC50	96h	Fish	→0.1mg/l	2
NOEC(ECx)	504h	Crustacea	→0.034mg/l	1
EC50	96h	Algae or other aquatic plants	→2.8mg/l	1

naphtha petroleum. light aromatic solvent

END POINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
EC50	72h	Algae or other aquatic plants	19mg/l	1
EC50	48h	Crustacea	6.14mg/l	1
NOEC(ECx)	72h	Algae or other aquatic plants	1mg/l	1
EC50	96h	Algae or other aquatic plants	64mg/l	2

xylene

END POINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
EC50	72h	Algae or other aquatic plants	4.6mg/l	2
EC50	48h	Crustacea	1.8mg/l	2
LC50	96h	Fish	2.6mg/l	2
NOEC(ECx)	73h	Algae or other aquatic plants	0.44mg/l	2

4,4'-diphenylmethane diisocyanate (MDI)

END POINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
BCF	72h	Fish	61-150	7
NOEC(ECx)	48h	Crustacea	→=10mg/l	2
LC50	96h	Fish	→100mg/l	2
EC50	73h	Crustacea	→100mg/l	2

cumene

END POINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
EC50	72h	Algae or other aquatic plants	1.29mg/l	2
EC50	48h	Crustacea	4mg/l	1
LC50	96h	Fish	2.7mg/l	2
NOEC(ECx)	96h	Crustacea	0.4mg/l	1

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and /or delayed, to the structure and/ or functioning of natural ecosystems.

For 1,2,4 - Trimethylbenzene:

Half-life (hr) air: 0.48-16;

Half-life (hr) H2O surface water: 0.24 -672;

Half-life (hr) H2O ground: 336-1344;

Half-life (hr) soil: 168-672;

Henry's Pa m<sup>3</sup> /mol: 385 -627;

Bioaccumulation: not significant. 1,2,4-Trimethylbenzene is a volatile organic compound (VOC) substance.

Atmospheric Fate: 1,2,4-trimethylbenzene can contribute to the formation of photochemical smog in the presence of other VOCs.

Degradation of 1,2,4-trimethylbenzene in the atmosphere occurs by reaction with hydroxyl radicals. Reaction also occurs with ozone but very slowly (half life 8820 days).

Aquatic Fate: 1,2,4-Trimethylbenzene volatilizes rapidly from surface waters with volatilization half-life from a model river calculated to be 3.4 hours. Biodegradation of 1,2,4- trimethylbenzene has been noted in both seawater and ground water. Various strains of Pseudomonas can biodegrade 1,2,4-trimethylbenzene.

Terrestrial Fate: 1,2,4-Trimethylbenzene also volatilizes from soils however; moderate adsorption to soils and sediments may occur. Volatilization is the major route of removal of 1,2,4- trimethylbenzene from soils; although, biodegradation may also occur. Due to the high volatility of the chemical it is unlikely to accumulate in soil or surface water to toxic concentrations.

Ecotoxicity: No significant bioaccumulation has been noted. 1,2,4-Trimethylbenzene is moderately toxic to fathead minnow and slightly toxic to dungeness crab. 1,2,4- Trimethylbenzene has moderate acute toxicity to aquatic organisms. No stress was observed

in rainbow trout, sea lamprey and Daphnia magna water fleas. The high concentrations required to induce toxicity in laboratory animals are not likely to be reached in the environment.

For Aromatic Substances Series:

Environmental Fate: Large, molecularly complex polycyclic aromatic hydrocarbons, or PAHs, are persistent in the environment longer than smaller PAHs.

Atmospheric Fate: PAHs are 'semi-volatile substances' which can move between the atmosphere and the Earth's surface in repeated, temperature-driven cycles of deposition and volatilization. Terrestrial Fate: BTEX compounds have the potential to move through soil and contaminate ground water, and their vapors are highly flammable and explosive. Ecotoxicity - Within an aromatic series, acute toxicity increases with increasing alkyl substitution on the aromatic nucleus. The order of most toxic to least in a study using grass shrimp and brown shrimp was dimethylnaphthalenes → methylnaphthalenes → naphthalenes. Anthracene is a phototoxic PAH. UV light greatly increases the toxicity of anthracene to bluegill sunfish. Biological resources in strong sunlight are at more risk than those that are not. PAHs in general are more frequently associated with chronic risks.

For C9 aromatics (typically trimethylbenzene - TMBs)

Chemicals in this category possess properties indicating a hazard for the environment (acute toxicity for fish, invertebrates, and algae from 1 to 10 mg/L). Category members are readily biodegradable, except 1,3,5-trimethylbenzene (CAS RN 108-67-8). Category members are not expected to be bioaccumulative.

Environmental Fate: In the air, category member constituents have the potential to rapidly degrade through indirect photolytic processes mediated primarily by hydroxyl radicals with calculated degradation half-lives ranging from 0.54 to 2.81 days (based on a 12-hour day and a hydroxyl radical concentration of  $5 \times 10^{-5}$ ). Aqueous photolysis and hydrolysis will not contribute to the transformation of category chemical constituents in aquatic environments because they are either poorly reactive or not susceptible to these reactions.

Results of the Mackay Level I environmental distribution model show that chemical constituents of C9 Aromatic Hydrocarbon Solvents Category members have the potential to partition to air (96.8 to 98.9%), with a negligible amount partitioning to water (0.2 to 0.6%) and soil (0.9 to 2.7%). In comparison, Level III modeling indicates that category members partition primarily to soil (66.3 to 79.6%) and water (17.8 to 25.0%) compartments rather than air (2.4 to 8.4%) when an equal emission rate (1000 kg/hr) is assumed to each of the air, water, and soil compartments. When release (1000 kg/hr) is modeled only to either the air, water, or soil compartment, constituents are indicated in the modeling to partition primarily (→94%) to the compartment to which they are emitted as advection and degradation influence constituent concentration in compartments to which constituents are not released. Solvent naphtha, (pet.), light aromatic (CAS RN 64742-95-6), 1,2,4-trimethylbenzene (CAS RN 95-63-6), and 1-ethyl-3-methylbenzene (CAS RN 620-14-4) were determined to be readily biodegradable based on the studies that used the TG OECD 301F (the latter substance is used to characterize the potential biodegradability of the category member, ethylmethylbenzene (CAS RN 25550-14-5)). These three substances exceed 60%

biodegradation in 28 days and met the 10-day window criterion for ready biodegradation. In comparison 1,3,5-trimethylbenzene (CAS RN 108-67-8) was not readily biodegradable. It achieved 42% biodegradation after 28 days and 60% biodegradation after 39 days.

The result for the multi-constituent substance (CAS RN 64742-95-6), a UVCB, characterizes the biodegradability of that substance as a whole, but it does not suggest that each constituent is equally biodegradable. As with all ready biodegradation test guidelines, the test system and study design used with these substances (OECD TG 301F) is not capable of distinguishing the relative contribution of the substances' constituents to the total biodegradation measured.

Based on Henry's Law constants (HLCs) representing a potential to volatilize from water that range from 590 to 1000 Pa·m<sup>3</sup>/mole, the potential to volatilize from surface waters for chemicals in the C9 Aromatic Hydrocarbon Solvents Category is expected to be high.

Based on the measured bioconcentration factors that range from 23 to 342 for 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene, the category members are not expected to be bioaccumulative.

Ecotoxicity

Acute toxicity values used to characterize this category for fish (LL50; LC50) and invertebrates (EL50; EC50) range from 3.5 to 9.2 mg/L, based on measured data. For algae, one study for a category member (CAS RN 64742-95-6) resulted in a 72-hr EC50 of 2.4 mg/L (biomass) and 2.7 mg/L (growth rate) based on measured concentrations.

The algal 72-hour NOEC (no observed effect concentration) for biomass and growth rate is 1.3 mg/L, based on mean measured concentrations. A 21-day Daphnia magna reproduction study with 1,3,5-trimethylbenzene (CAS RN 108-67-8) resulted in a NOEC value of 0.4 mg/L, based on a minimum measured value.

For Xylenes:

log K<sub>oc</sub> : 2.05-3.08; K<sub>oc</sub> : 25.4-204; Half-life (hr) air : 0.24-42; Half-life (hr) H<sub>2</sub>O surface water : 24-672; Half-life (hr) H<sub>2</sub>O ground : 336-8640; Half-life (hr) soil : 52-672; Henry's Pa m<sup>3</sup> /mol : 637-879; Henry's atm m<sup>3</sup> /mol - 7.68E-03; BOD 5 if unstated - 1.4,1%; COD - 2.56,13% ThOD - 3.125 : BCF : 23; log BCF : 1.17-2.41.

Environmental Fate: Most xylenes released to the environment will occur in the atmosphere and volatilisation is the dominant environmental fate process. Soil - Xylenes are expected to have moderate mobility in soil evaporating rapidly from soil surfaces. The extent of the degradation is expected to depend on its concentration, residence time in the soil, the nature of the soil, and whether resident microbial populations have been acclimated. Xylene can remain below the soil surface for several days and may travel through the soil profile and enter groundwater. Soil and water microbes may transform it into other, less harmful compounds, although this happens slowly. It is not clear how long xylene remains trapped deep underground in soil or groundwater, but it may be months or years.

Atmospheric Fate: Xylene evaporates quickly into the air from surface soil and water and can remain in the air for several days until it is broken down by sunlight into other less harmful chemicals. In the ambient atmosphere, xylenes are expected to exist solely in the vapour phase. Xylenes are degraded in the atmosphere with an estimated atmospheric lifetime of about 0.5 to 2 days. Xylene may contribute to photochemical smog formation. p-Xylene has a moderately high photochemical reactivity under smog conditions, higher than the other xylene isomers. The photooxidation of p-xylene results in the production of carbon monoxide, formaldehyde, glyoxal, methylglyoxal, 3-methylbenzyl nitrate, m-tolualdehyde, 4-nitro-3-xylene, 5-nitro-3-xylene, 2,6-dimethyl-p-benzoquinone, 2,4-dimethylphenol, 6-nitro-2,4-dimethylphenol, 2,6-dimethylphenol, and 4-nitro-2,6-dimethylphenol.

Aquatic Fate: p-xylene may adsorb to suspended solids and sediment in water and is expected to volatilise from water surfaces.

Estimated volatilisation half-lives for a model river and model lake are 3 hours and 4 days, respectively. Measurements taken from

goldfish, eels and clams indicate that bioconcentration in aquatic organisms is low. Photo-oxidation in the presence of humic acids may play an important role in the abiotic degradation of p-xylene. p-Xylene is biodegradable and has been observed to degrade in pond water however; it is unclear if it degrades in surface waters. p-Xylene has been observed to degrade in anaerobic and aerobic groundwater; however, it is known to persist for many years in groundwater, at least at sites where the concentration might have been quite high. Ecotoxicity: Xylenes are slightly toxic to fathead minnow, rainbow trout and bluegill and not acutely toxic to water fleas. For *Photobacterium phosphoreum* EC50 (24 h): 0.0084 mg/L. and *Gammarus lacustris* LC50 (48 h): 0.6 mg/L.

For Phthalate Esters:

Terrestrial Fate: Phthalate esters have been observed to be broken down by a wide range of bacteria. Biodegradation is, therefore, expected to be the dominant fate in surface soils and sediments.

Little information is available on the fate of phthalate esters in soil, even though the primary point of entry, (landfills). The migration of phthalate esters out of plastics is slow. The formation of soluble complexes may increase their mobility. Phthalate esters may also be subject to biological breakdown, however; measured degradation rates are highly variable. The substances are expected to have half-lives of < 1 week to several months, in soil.

Atmospheric Fate: The primary fate of these substances in the air is attack by hydroxyl radicals, with a half-life of < 1 day, however, they are not expected to partition to the air. These substances are expected to react with atmospheric ozone. Phthalate esters are expected to exist in the vapor form and adsorb to airborne particulates. Physical removal by particulate settling/washout in precipitation will also occur. Phthalate esters are not expected to be broken down directly by sunlight.

Aquatic Fate: These substances are expected to have a half-life of < 1 day to 2 weeks, in surface/marine water. The two transport mechanisms that appear to be most important for the phthalates in the aquatic environment are adsorption onto suspended solids/particulate matter, and complexation with natural organic substances, such as fulvic acid, to form water-soluble complexes/emulsions. Breakdown by sunlight, oxidation, and breakdown by water are too slow to be environmentally significant. Evaporation of the substance from water is not expected to occur. Half-lives, in pH neutral waters range from 3.2 years, (for dimethyl phthalate), to 2,000 years, (for di(2-ethylhexyl) phthalate). The oceans may be considered the ultimate natural reservoir, (sink), for phthalate esters introduced into unimpeded rivers.

Ecotoxicity: These substances are not expected to accumulate/concentrate in aquatic species and are readily metabolized by fish and microbiota. Phthalate esters have been found in open ocean environments, in deep sea jelly fish, Atlantic herring, and mackerel. Phthalic ester plasticizers are recognized as general contaminants of almost every soil and water ecosystem. In general, they have low acute toxicity but, there is substantial evidence that they are cancer causing. Other subtle chronic effects have also been reported. Some phthalates, (notably di-2-ethylhexyl phthalate and dibutyl phthalate), may be detrimental to the reproduction of *Daphnia magna* water fleas, zebra fish and guppies. Phthalates form suspensions in water which may cause adverse effects, through physical contact, with *Daphnia* water fleas, at very low concentrations. These substances are considered to have the potential to harm aquatic organisms at relatively low concentrations.

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

## 12.2. Persistence and degradability

### Ingredient

diisononyl phthalate  
xylene  
4,4'-diphenylmethane diisocyanate (MDI)  
cumene

### Persistence: Water/Soil

HIGH  
HIGH (Half-life = 360 days)  
LOW (Half-life = 1 days)  
HIGH

### Persistence: Air

HIGH  
LOW (Half-life = 1.83 days)  
LOW (Half-life = 0.24 days)  
HIGH

## 12.3. Bioaccumulative potential

### Ingredient

diisononyl phthalate  
xylene  
4,4'-diphenylmethane diisocyanate (MDI)  
cumene

### Bioaccumulation

LOW (BCF = 183.8)  
MEDIUM (BCF = 740)  
LOW (BCF = 15)  
LOW (BCF = 35.5)

## 12.3. Mobility in soil

### Ingredient

diisononyl phthalate  
4,4'-diphenylmethane diisocyanate (MDI)  
cumene

### Bioaccumulation

LOW (Log KOC = 467200)  
LOW (Log KOC = 376200)  
LOW (Log KOC = 817.2)

## SECTION 13: Disposal considerations

### Waste treatment methods

Product / Packaging disposal

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- 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.
- Where possible retain label warnings and SDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- **DO NOT allow wash water from cleaning or process equipment to enter drains.**
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

## SECTION 14: Transport information

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

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

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

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

Not Applicable

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

Product name	Group
diisononyl phthalate	: Not Available
naphtha petroleum, light aromatic solvent	: Not Available
xylene	: Not Available
4,4'-diphenylmethane diisocyanate (MDI)	: Not Available
cumene	: Not Available
All other substances - non-hazardous	: Not Available

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

Product name	Group
diisononyl phthalate	: Not Available
naphtha petroleum, light aromatic solvent	: Not Available
xylene	: Not Available
4,4'-diphenylmethane diisocyanate (MDI)	: Not Available
cumene	: Not Available
All other substances - non-hazardous	: Not Available

## SECTION 15: Regulatory information

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

**diisononyl phthalate is found on the following regulatory lists**

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

**naphtha petroleum, light aromatic solvent is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

Chemical Footprint Project - Chemicals of High Concern List

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

### xylene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5  
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6  
Australian Inventory of Industrial Chemicals (AIIC)  
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

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

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring  
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6  
Australian Inventory of Industrial Chemicals (AIIC)  
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic

### cumene is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals  
Australian Inventory of Industrial Chemicals (AIIC)  
Chemical Footprint Project - Chemicals of High Concern List  
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

## 15.2. National Inventory Status

### National Inventory

### Status

Australia - AIIC / Australia Non-Industrial Use	: Yes
Canada - DSL	: Yes
China - IECSC	: Yes
Europe - EINEC / ELINCS / NLP	: Yes
Japan - ENCS	: Yes
Korea - KECI	: Yes
New Zealand - NZIoC	: Yes
Philippines - PICCS	: Yes
USA - TSCA	: Yes
Taiwan - TCSI	: Yes
Mexico - INSQ	: Yes
Vietnam - NCI	: Yes
Russia - FBEPH	: Yes

Legend:

Yes = All CAS declared ingredients are on the inventory

No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

## SECTION 16: Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources.

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

### Definitions and abbreviations

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

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