



Emergency Telephone No. +612 9634-5560 / +61 412 226 505

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**MATERIAL SAFETY DATA SHEET**  
**PE234 POLYESTER UNDERCOAT - PART "B"**

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Ref msds 00260B

**1. IDENTIFICATION**

PRODUCT NAME : PE234 POLYESTER UNDERCOAT - PART "B"  
CORRECT SHIPPING NAME : PAINT RELATED MATERIAL, LFP  
OTHER NAMES : PE234 P/E UNDERCOAT - Part "B" / PE234 UNDERCOAT - Part "B"  
PRODUCT CODE : PE234 - PART "A"  
AVAILABLE COLORS : White  
UN NUMBER : 1263  
AICS STATUS : All Components Listed  
DANGEROUS GOODS CLASS : 3.1 (Highly flammable liquid)  
IMO HAZARD CLASS : INFLAMMABLE LIQUID/3.2  
SUBSIDIARY RISK : None HAZCHEM CODE : •3YE  
PACKAGING GROUP : II AS 1940 CLASS : PG II  
POISONS SCHEDULE : S5 EPG : 3A1

USE : High build 2-pack undercoat for use on absorbent timber & manufactured board surfaces.

**For industrial use only in spray areas complying with relevant regulations.**

**This product is one component of a multiple component system.**

**All components must be mixed together immediately prior to use.**

**COMPANY / UNDERTAKING**

BC COATINGS  
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The following personnel should be contacted depending on the nature of the inquiry.

TECHNICAL MANAGER	PRODUCTION MANAGER
MANAGING DIRECTOR	SALES MANAGER
AUSTRALIAN POISONS INFORMATION CENTRE	24 HOUR SERVICE : 13 11 26
POLICE OR FIRE BRIGADE	: 000 (exchange) : 1100

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure.

Always read the Material Safety Data Sheets (MSDS) for any products you use at work.

They contain useful information on hazards and control measures.

Safety Data Sheets are current for a maximum of three years but may be updated more frequently.

Please ensure that you have a current copy.

The information given in this bulletin and by the company's technical staff is provided as a general guide only to facilitate the adoption of appropriate measures in relation to handling, storage and disposal of the product.

Although BC Coatings has taken all reasonable care to ensure that the information is accurate, it accepts no responsibility for any loss or damage however caused that results there from and does not warrant such accuracy whether or not the information originated with BC Coatings.

BC Coatings urges each recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product.

The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety.

Users of the product are requested to contact BC Coatings technical section for detailed information regarding the qualities and characteristics of the product before it is used.

We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

**2. HAZARDS IDENTIFICATION**

Leaks of gas or spills of liquid can readily form flammable mixtures at temperatures at or above flash point.

**Hazardous according to criteria of Worksafe Australia**

**CLASSIFICATION AND LABELLING ACCORDING TO NOHSC CODES**

CLASSIFICATION / SYMBOL : HIGHLY FLAMABLE / F  
CLASSIFICATION / SYMBOL : HARMFUL / Xn - IRRITANT / Xi  
GOVERNING DIRECTIVE : National Code of practice for the Labelling of Hazardous Substances.  
LABEL NAME : Paint Related Material, LFP

**HAZARDS IDENTIFICATION****RISK PHRASES**

R11 Highly flammable.  
R18 In use, may form flammable/explosive vapour-air mixture.  
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.  
R33 Danger of cumulative effects.  
R36/37/38 Irritating to eyes, respiratory system and skin.  
R42/43 May cause sensitization by inhalation and skin contact.  
R66 Repeated exposure may cause skin dryness or cracking.  
R65 May cause lung damage if swallowed.  
R67 Vapours may cause drowsiness and dizziness.

**SAFETY ADVICE**

S02 Keep out of the reach of children.  
S3/7/9 Keep container tightly closed in a cool, well ventilated place.  
S16 Keep away from sources of ignition - No smoking.  
S20/21 When using, do not eat, drink or smoke.  
S23 Do not breathe gas/fumes/vapour/spray  
S24/25 Avoid contact with skin and eyes.  
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S29 Do not empty into drains.  
S33 Take precautionary measures against static discharges.  
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.  
S43B In case of fire use sand, earth, chemical powder or alcohol type foam  
S45 In case of accident or if you feel unwell, seek medical advice immediately.  
(Show label or MSDS where possible).  
S51 Use only in well ventilated areas.  
S60 This material and its container must be disposed of as hazardous waste.  
S61 Avoid release into the environment.  
S62 If swallowed, do NOT induce vomiting.

**2. HAZARDS IDENTIFICATION (continued)****HEALTH EFFECTS - ACUTE EXPOSURE**

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label.

Principal routes of exposure are usually by inhalation of vapour and skin contact/absorption.

Acute (short term) health effects may occur immediately or shortly after exposure to this product.

High vapour concentrations are irritating to the eyes and the respiratory tract, may cause vomiting, coughing, pulmonary irritation, headaches and dizziness, are anaesthetic and may have other central nervous system effects.

Lower levels may cause trouble concentrating, headaches, and slowed reflexes.

Narcotic effects occur at levels below the exposure standard.

Vapour may cause conjunctivitis.

Temporary corneal clouding may also result and may last several hours.

The liquid can severely burn the eyes.

Corneal damage will occur after prolonged contact.

If a large amount (>1 ml/kg) is ingested and retained can cause gastrointestinal irritation, kidney damage and central nervous system effects occur and include weakness, dizziness, unconsciousness and convulsions.

Prolonged, repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis.

Effects of solvents on human health and the environment depend on how much solvent is present and the length and frequency of exposure.

Effects also depend on the health of a person or the condition of the environment when exposure occurs.

**TARGET ORGANS** : Eyes, skin, respiratory system

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE**

: Skin disorders, damaged skin, respiratory system disease, kidney, liver, or blood disorders.

**ROUTES OF ENTRY** : Inhalation, ingestion, eye contact, skin contact

**SWALLOWED**

Considered an unlikely route of entry in commercial/industrial environments.

The liquid is highly irritating to mouth, throat and the gastrointestinal tract and may be harmful if swallowed in quantity.

Tends to break into a foam if the patient vomits.

Ingestion can result in nausea, cramps, abdominal pain, vomiting, diarrhoea and central nervous system depression.

Small amounts of liquid aspirated into respiratory system during ingestion or from vomiting may cause, broncho-pneumonia pulmonary oedema or potentially lethal chemical pneumonitis.

If a large amount (> 1 ml/kg) is ingested and retained, symptoms of CNS depression and irritation occur and include weakness, dizziness, unconsciousness and convulsions.

If the victim is uncoordinated there is a greater likelihood of vomit entering the lungs and causing subsequent complications.

**EYE**

The vapour and the liquid are both severe eye irritants.

The liquid is highly irritating to the eyes and is capable of causing temporary impairment of vision and / or transient eye inflammation, ulceration and corneal damage if not promptly and adequately treated.

**SKIN**

The liquid is irritating to the skin if contact is prolonged and may cause de-fatting and drying of the skin which may lead to dermatitis from repeated exposures over long periods.

Capable of being absorbed by the skin and may cause central nervous system depression.

Toxic effects may result from skin absorption.

Absorption by skin may readily exceed vapour inhalation exposure.

Symptoms for skin absorption are the same as for inhalation.

Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

Capable of causing skin sensitization and allergic skin reactions.

Bare unprotected skin, abraded or irritated skin, open cuts and etc., should not be exposed to this material.

The material may accentuate any pre-existing skin condition.

**2. HAZARDS IDENTIFICATION (continued)****INHALED**

Acute effects from inhalation of vapour/mist concentrations above recommended exposure levels produce dryness of the mouth and throat, are irritating to the eyes, mucous membranes and the upper respiratory tract (with coughing and sneezing), could be anaesthetic and may have other central nervous system effects (characterized by headache, drowsiness, dizziness, nausea, vomiting, increased reaction time, fatigue, loss or co-ordination, impaired judgement, lassitude, irritability, tingling in fingers and toes and in extreme cases coma), gastrointestinal disturbances (e.g. nausea, anorexia and flatulence), low blood pressure and rapid and irregular pulse as well as affecting the kidneys, liver, and the heart.

If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death.

Inhalation hazard is increased at higher temperatures.

Toxic effects are increased by consumption of alcohol.

Central nervous system (CNS) depression may be evident early.

Repeated exposure may cause sensitization and/or allergic reactions.

Aspiration of liquid into lungs can cause serious (even fatal) pneumonitis.

Inhalation of vapours over long periods causes irritation of the respiratory tract, coughing, headache.

Significant exposure to this chemical may adversely affect people with chronic disease of the respiratory system, skin and/or eyes.

Physical exercise may antagonize this effect.

**HEALTH EFFECTS - CHRONIC EXPOSURE**

Chronic (long term) health effects can occur at some time after exposure to this product and can last for months or years.

Principal routes of exposure are usually by skin contact/absorption and inhalation of vapour.

Prolonged or continuous skin contact with liquid may cause de-fatting with drying, cracking, irritation and dermatitis following.

Evidence from animal tests indicate that repeated or prolonged solvent inhalation exposures could result in kidney disorders, nervous system impairment, liver and blood changes. [PATTYS].

Capable of causing skin sensitization and allergic skin reactions.

Symptoms of chronic exposure may include headaches, weakness, loss of appetite, burning eyes, stomach-ache, nausea, vomiting, sore throat, tiredness, insomnia, heart burn, intestinal pain, liver and kidney damage, colitis, dermatitis, poor memory and difficulty in concentration.

The vapours may cause smarting of the eyes and respiratory tract.

Inhalation of material may aggravate asthma and inflammatory or fibrotic pulmonary diseases.

Long term exposure can cause chronic nose and throat irritation.

This chemical has not been adequately evaluated to determine whether brain or other nerve damage could occur with repeated exposure.

However, many solvents and other petroleum based chemicals have been shown to cause such damage.

Effects may include reduced memory and concentration, personality changes (withdrawal, irritability), fatigue, sleep disturbances, reduced coordination, and/or effects on nerves supplying internal organs (autonomic nerves) and/or nerves to the arms and legs (weakness, "pins and needles").

**MIXED EXPOSURES**

Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure.

Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

Because more than light alcohol consumption can cause liver damage, drinking alcohol can increase the liver damage caused by this product.

**3. COMPOSITION**

<u>CHEMICAL ENTITY</u>	<u>CAS No.</u>	<u>ANNEX I INDEX No.</u>	<u>EINECS No.</u>	<u>Proportion (% w/w)</u>
Unsaturated Polyester Polymer (proprietary composition)	Not Available	Not Available	Not Available	10 - 30
Styrene Monomer (contains 4-Tert-Butyl Catechol as stabilizer)	100-42-5	Not Available	202-851-5	10 - 30
4-Tert-Butyl Catechol	98-29-3	Not Available	202-653-9	< 0.1
Petroleum Hydrocarbon Mixture (Aromatic) (Proprietary Composition)	Not Available	Not Available	Not Available	< 10
Petroleum Hydrocarbons (Aliphatic)	64742-82-1	649-330-00-2	265-185-4	< 10
Acetone	67-64-1	606-001-00-8	200-662-2	10 - 30
Titanium Dioxide (Proprietary Composition)	13463-57-7	Not Available	236-675-5	< 10
Inert Fillers / Extenders / Pigments	Not Available	Not Available	Not Available	10 - 30
Amorphous (Precipitated) Silica (containing no asbestos & < 1% crystalline silica) (Proprietary Composition)	112926-00-8	Not Available	Not Available	< 10
Miscellaneous Additives (Proprietary Composition)	Not Available	Not Available	Not Available	< 10

All components are registered in accordance with Australian Inventory of Chemical Substances.

More detailed information available to medical staff in case of an emergency.

**4. FIRST AID MEASURES**

Poison Information Centres in each State capital city can provide additional assistance for scheduled poisons.

**SWALLOWED**

Harmful if swallowed.

If the victim is convulsing or unconscious, do NOT give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body.

**IMMEDIATELY** call a doctor or Poisons Information Centre and/or transport to an emergency facility or hospital.

**DO NOT MAKE AN UNCONSCIOUS PERSON VOMIT.**

If the victim is conscious and not convulsing, rinse mouth out with plenty of water and give 1 or 2 glasses of water to drink to dilute the chemical and **IMMEDIATELY** call a doctor or hospital or Poisons Information Centre.

Tends to break into a foam if the patient vomits.

Do **NOT** induce vomiting due to the hazard of solvent aspiration into the lungs which may cause mild to severe pulmonary injury and possibly death.

Be prepared to transport the victim to a hospital if advised by a physician.

Should vomiting occur, place patient's head downwards, head lower than hips, to prevent vomit entering the lungs.

This is especially important as aspiration of this material into the lungs can cause chemical pneumonia, which can be fatal.

Call a doctor and/or transport to an emergency facility or hospital **IMMEDIATELY**.

**EYE**

If this product comes in contact with the eyes, first check the victim for contact lenses and remove if present.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

**IMMEDIATELY** and continuously irrigate with copious quantities of fresh, low pressure water or normal saline solution for at least 15 minutes while simultaneously calling a hospital or Poisons Information Centre.

Eyelids should be held open.

Ensure irrigation under the eyelids by occasionally lifting upper and lower lids.

Remove clothing, if contaminated, and gently wash skin with water.

Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician.

Seek **IMMEDIATE** medical attention, preferably from an ophthalmologist.

**SKIN**

If this product comes in contact with the skin

**IMMEDIATELY** soak contaminated clothing, including footwear, with water.

Remove all contaminated clothing, including footwear, and gently wash the affected areas thoroughly with water, then mild soap and water.

If exposure has been prolonged or severe or if swelling, redness or irritation occur, **IMMEDIATELY** seek medical advice and be prepared to transport the victim to a hospital for treatment.

Launder contaminated clothing before re-use.

Allow contaminated footwear to dry thoroughly before re-using. Discard internally contaminated gloves and shoes.

Can be absorbed through the skin with resultant toxic effects.

**INHALED**

If fumes or combustion products are inhaled :

**IMMEDIATELY** remove affected person(s) to fresh air, taking care not to become affected yourself.

Provide proper respiratory protection to rescuers entering an unknown atmosphere.

Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used.

If not available, use a level of protection greater than or equal to that advised under Respirator Recommendation.

Remove any contaminated clothing and loosen remaining clothing.

If breathing is normal, allow the patient to assume the most comfortable position and keep warm. Keep at rest until fully recovered.

If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital.

If breathing is difficult and patient is cyanotic (blue), ensure airways are clear and have a qualified person give oxygen through a face mask.

If breathing has stopped, commence Expired Air Resuscitation (E.A.R.).

In the event of cardiac arrest, commence Cardio-Pulmonary Resuscitation (C.P.R.)

Seek **IMMEDIATE** medical attention.

**4. FIRST AID MEASURES - continued****ADVICE TO DOCTOR**

Principal routes of exposure are skin contact/absorption and inhalation of the vapour/spray mist.

Primary threat to life from ingestion and/or inhalation, is respiratory failure.

Extreme care must be taken to prevent aspiration.

Pulmonary oedema is a possible complication following aspiration.

Onset of symptoms may be delayed several hours after exposure.

There is no specific antidote.

Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

Individuals experiencing breathing difficulties after exposure to vapour generated in aerosol applications should be observed for at least 48 hours in case delayed respiratory complications develop.

Any material aspirated during vomiting may cause lung injury.

Pulmonary oedema is a possible complication following aspiration.

If vomiting occurs, hold patient with head below the hips to prevent pulmonary aspiration.

If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (e.g. gastric lavage after endotracheal intubation).

Skin sensitization may result from a single acute exposure.

Sensitization may cause difficulty in breathing similar to asthma.

**MEDICAL TESTING**

For those with frequent or potentially high exposure (half the TLV or greater, or significant skin contact), the following is recommended before beginning work and at regular times after that:

Exam of the eyes by slit lamp.

If symptoms develop or overexposure is suspected, the following may be useful:

Liver and kidney function tests.

Complete blood count to include at least a red cell count, a white cell count, haemoglobin and haematocrit.

Urine concentration of Methylhippuric Acid (at the end of work-shift) as an index of overexposure.

Interview for brain effects, including recent memory, mood (irritability, withdrawal), concentration, headaches, malaise and altered sleep patterns.

Consider cerebellar, autonomic and peripheral nervous system evaluation.

Positive and borderline individuals should be referred for neuropsychological testing.

Comprehensive medical, work and reproductive histories with special emphasis directed to the haematological system and symptoms related to pulmonary and mucous membrane irritation.

A comprehensive physical examination with emphasis given to haematological and pulmonary systems, mucous membranes, skin and eyes.

In addition, the physician should determine the worker's suitability for respirator use.

Workers or job applicants who have medical conditions that would be aggravated by the use of a respirator need to receive counselling on the increased risk of impairment of their health.

In certain cases, to provide sound medical advice to the employer and the employee, the physician must evaluate situations not directly related to components contained in this product.

For example, employees with skin diseases, whether or not they are product related, may be unable to tolerate wearing protective clothing.

In addition, those with chronic respiratory diseases may not tolerate the wearing of respirators.

Additional tests and procedures that will help the physician determine which employees are medically unable to wear respirators must include a pulmonary function test with measurement of the employee's forced vital capacity (FVC), and forced expiratory volume at one second (FEV1).

Ratios of FEV1 to FVC as well as measured FVC and measured FEV1 to their expected values corrected for variations due to age, sex, race, and height must be calculated. Whether a chest X-ray will provide useful information should be considered.

Any evaluation should include a careful history of past and present symptoms with an exam.

Medical tests that look for damage already done are not a substitute for controlling exposure.

**Request copies of your medical testing. You have a legal right to this information.**

**5. FIRE FIGHTING MEASURES**

**For Large Spills And Fires IMMEDIATELY Alert Fire Brigade And Tell Them Location And Nature Of Hazard.**

**FIRE EXTINGUISHING MEDIA**

Either allow fire to burn under controlled conditions or extinguish with alcohol stable foam, carbon dioxide (CO<sub>2</sub>), or dry chemical. Try to cover liquid spills with foam.

For small fires use alcohol-type or all-purpose-type foam, dry agent (carbon dioxide - CO<sub>2</sub>), or dry chemical powder), water fog in large quantities.

For large fires use foam (by manufacturer's recommended techniques) or water fog (or if unavailable fine water spray). Water spray may be ineffective, but should be used in case of larger fires, water spray be used to keep fire exposed containers cooled.

Avoid spraying water directly into storage containers due to danger of boilover.

Fire-men have to wear self-contained breathing apparatus.

This material may produce a floating fire hazard.

**FIRE AND EXPLOSION HAZARD**

Flammable liquid, can release vapours that form flammable mixtures at temperatures at or above the flash point.

Liquid and vapour are highly flammable.

Severe explosion hazard, in the form of vapour, when exposed to heat, flame and/or oxidizers.

Severe fire hazard when exposed to heat, flame and/or oxidizers.

Burns very rapidly and explosively.

In the case of incomplete combustion, may form toxic materials such as carbon monoxide, carbon dioxide, fumes and smoke.

When burning may form toxic materials such as carbon monoxide (CO,) carbon dioxide (CO<sub>2</sub>), metal oxides, various hydrocarbons, fumes and smoke.

Vapour forms and explosive mixture with air.

Leaks of gas or spills of liquid can readily form flammable/explosive mixtures at temperatures at or above flash point when exposed to flame or spark.

Vapours from this product and may travel or be moved a considerable distance along the vapour trail by air currents and be ignited explosively by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations a considerable distance from product handling point.

Do not store or mix with strong oxidants (such as chlorine, bromine and fluorine) since violent reactions occur and may cause fire.

Heating may cause expansion or decomposition leading to violent rupture of containers.

Product can accumulate static charges which can cause an incendiary electrical discharge.

Flammable hydrogen gas may be produced by the reaction of the aluminium flake with water, especially at high temperatures.

This product may form a floating fire hazard on water.

**FIRE FIGHTING MEASURES**

If employees are expected to fight fires, they must be trained and equipped as stated in the appropriate regulations.

Shut off any leak if safe to do so and remove sources of re-ignition.

If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop leak.

Thermal decomposition and incomplete combustion may yield carbon monoxide, carbon dioxide, oxides of metals, oxides of silicone, fumes and smoke.

If safe to do so, remove containers from the path of the fire and keep cool with water spray.

Water spray may be used to flush spills away from exposures.

Keep storage tanks, pipelines, fire exposed surfaces etc. cool with water spray.

Minimize breathing gases, vapour, fumes or decomposition products.

Firefighters should wear self-contained breathing apparatus with a full face piece and operated in positive pressure mode.

Avoid spraying water directly into storage containers due to danger of boilover.

Water spray may be used to flush spills away from exposures.

Prevent run off from fire control or dilution from entering waterways, sewers or drinking water supply.

**HAZCHEM CODE**

: •3YE

**6. ACCIDENTAL RELEASE MEASURES****SPILLS**

There should a written emergency plan developed for each workplace or work operation.

**For Large Spills And Fires IMMEDIATELY Alert Fire Brigade And Tell Them Location And Nature Of Hazard.**

Pollutant - contain spillage.

Stop liquid at the source if safe to do so.

Clean up spills IMMEDIATELY.

Slippery when spilt.

Do not empty into drains.

Keep unauthorized persons away at a safe distance and move upwind until clean up is complete.

Shut off all possible sources of ignition ensure adequate ventilation / exhaust ventilation.

No smoking, naked lights, open flames or heat sources.

May be violently or explosively reactive. Use only spark-free and/or explosion proof equipment.

Keep this product out of a confined space, such as a sewer, because of the possibility of an explosion, unless the sewer is designed to prevent the build up of explosive concentrations.

Avoid breathing vapours and contact with skin and eyes.

Wear breathing apparatus, gloves and full protective clothing to prevent skin and eye contamination and inhalation of vapours.

Water spray may be used to flush spills away from exposures.

If a leak or spill has not ignited, use water spray or fog to disperse/absorb the vapours and to protect men attempting to stop leak.

Advise authorities if product has entered or may enter sewers, watercourses, ground water or has contaminated soil or vegetation

**MINOR SPILLS**

Clean up spills immediately.

Small spills may be absorbed onto any absorbent material such as sand, soil or vermiculite or other absorbent material.

Wipe up.

Collect residues and place in sealed, labelled, flammable waste container.

Follow state or local authority regulations and guidelines for disposal of the waste.

**MAJOR SPILLS**

Consider evacuation.

Alert Fire Brigade and tell them location and nature of hazard.

Warn occupants of down wind areas of fire and explosion hazard.

In the event of a spillage, advise the local environment protection authority or emergency services that the product has entered or may enter sewers, drains, watercourses, or has contaminated soil or vegetation

Avoid breathing vapours and contact with skin and eyes.

Wear breathing apparatus, protective gloves and full protective clothing.

Dyke the area with sand, earth or vermiculite, to prevent spreading and to prevent it entering sewers, drains or natural waterways.

Take measures to minimize the effect on ground water.

Advise authorities product has entered or may enter sewers, watercourses or extensive land areas.

Water spray or fog may be used to disperse /absorb vapour.

Water spray may be used to flush spills away from exposures.

Collect recoverable product (using explosion proof or hand pump) into sealed, labelled, flammable containers for recycling or disposal.

Use only spark-free and/or explosion proof equipment.

Dilute contained spill with water.

Cover remainders with wet, absorbent material (e.g. soil, sand, vermiculite, fire retardant treated sawdust or other inert material).

Collect solid residues and seal in sealed, labelled flammable waste containers for later disposal.

Ventilate area well to evaporate remaining liquid and to dispel vapour.

Clean area with detergent and water - do not allow product to enter drains, sewers or water courses - inform the local authorities or emergency services if this occurs.

Do not re-enter the contaminated area until the Safety Officer (or other responsible person) has verified that the area has been properly cleaned.

After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

Dispose of at an appropriate licensed waste disposal site or facility in accordance with current applicable laws and regulations and product characteristics at time of disposal.

**7. HANDLING and STORAGE****HANDLING**

Prior to working with this product, you should be trained on its proper handling and storage.

Observe manufacturer's storing and handling recommendations.

Packing as supplied by manufacturer. (Metal can / Metal drum / Metal safety cans).

Handle containers with care.

Many plastics are unsuitable as storage and handling materials

Where possible, automatically pump liquid product from drums or other storage containers to process containers.

Explosion protection required.

Static ignition hazard can result from handling and use.

To prevent fire or explosion risk from static accumulation and discharge, effectively ground and bond product, transfer system and all process equipment, including tanks and drums.

Sources of ignition, such as smoking, open flames, or ignition sources are prohibited where this product is used, handled, or stored in a manner that could create a potential fire or explosion hazard.

Use **ONLY** non-sparking tools and equipment, especially when opening and closing containers of this product.

Avoid exposure to temperatures above 40 °C.

Protect containers against physical damage and check regularly for leaks.

Open containers slowly in order to control possible pressure release.

Ensure adequate ventilation (equivalent to outdoors), or exhaust ventilation in the working area to prevent build up of explosive atmosphere.

Exhaust ventilation necessary if product is sprayed.

The product is readily absorbed by the skin.

Irritating to eyes, skin and mucous membranes.

Avoid prolonged, repeated contact with eyes, skin contact and breathing vapours or mists.

The product is narcotic in high concentrations.

Intense smelling. Keep away from foodstuffs, clothing and odour sensitive materials.

Refer to AS 1940 (Storage and handling of flammable and combustible liquids) and AS 2865 (Safe working in a confined space), for more specific information on these subjects.

**STORAGE REQUIREMENT**

Store in an upright position.

Store in tightly closed, properly grounded, original metal containers in a cool, dry, well-ventilated, approved flammable liquid storage area away from direct sunlight.

Check all containers are clearly labelled.

Many plastics are unsuitable as storage and handling materials

Keep container dry and securely sealed when not in use.

Protect containers against physical damage and check regularly for spills and leaks.

Do NOT store in pits, depressions, basements or areas where vapours may be trapped.

Drums should be equipped with self-closing valves, pressure vacuum bungs, and flame arresters.

Materials are stable on storage, but should be stored in a cool and well ventilated place away from sources of ignition, strong oxidizing agents (liquid chlorine, bromine, fluorine, concentrated oxygen, sodium hypochlorite), acids, alkalis (since violent reactions occur) and odour sensitive materials.

Avoid exposure to temperatures above 40 °C.

This material may produce a floating fire hazard.

**PROCESS HAZARD**

Sudden release of hot organic chemical vapours or mists from process equipment operating at elevated temperatures and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources.

Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapours".

**8. EXPOSURE CONTROLS****ENGINEERING CONTROLS :**

None required when handling small quantities.

**OTHERWISE :**

Unless a less toxic chemical can be substituted for a hazardous substance, ENGINEERING CONTROLS are the most effective way of reducing exposure.

The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release.

Isolating operations can also reduce exposure.

Respirators serve as supplemental protection to reduce employee exposures when engineering and work practice controls are not sufficient to achieve the necessary reduction to or below the TWAs.

Use away from all ignition sources.

Ensure sufficient ventilation to maintain concentration below exposure standard in warehouse or closed storage areas.

Where rapid build up of vapours or mists are generated, particularly in enclosed areas, and natural ventilation is inadequate, a flame proof exhaust ventilation system is required.

Refer to AS 1940 - The storage and handling of flammable and combustible liquids and AS 2430 - Explosive gas atmospheres for further information concerning ventilation requirements.

Use with local exhaust ventilation or while wearing organic vapour /acid mist respirator (meeting the requirements of AS1715 & AS1716) or dust respirator/air supplied mask.

The effectiveness of an air purifying respirator is limited. Use it only for a single, short term exposure.

Refer also to protective measures for the other components used with this product.

Keep containers closed when not in use.

Equipment MUST be explosion proof.

Use dust containment system to reduce nuisance dust concentration to permissible exposure levels.

**NOTE :** Vapour is heavier than air and may collect in hollows, pits storage tanks or sumps.

Do NOT enter confined spaces where vapour may have collected without using an approved, positive pressure, self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716 ) and an observer present for assistance.

**LOCAL EXHAUST :** Face velocity > 20 m/min.

**FLAMMABILITY :**

Highly flammable liquid.

Can readily form flammable mixture with air.

May form explosive mixtures with air.

Avoid direct sources of heat, naked lights, sparks, all ignition sources and oxidising materials.

Prevent build up of flammable vapours.

Vapour may travel a considerable distance to source of ignition and flash back.

Explosion proof equipment necessary in areas where this product is being used.

Earth and bond all process equipment, including tanks, hoses and drums to avoid static charge build up.

Nearby equipment should be earthed.

Ensure ventilation is adequate to prevent build up of explosive atmosphere.

Refer to AS 1940 - Storage and handling of flammable and combustible liquids and AS 2865 - Safe working in a confined space, for more specific information on these subjects.

**8. EXPOSURE CONTROLS - continued****EXPOSURE LIMITS :**

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and air samples.

You have a legal right to obtain copies of sampling results from your employer.

If you think you are experiencing any work related health problems, see a doctor trained to recognize occupational diseases.

Take this MSDS with you.

No value has been assigned for this specific material by the National Occupational Health & Safety Commission.

However, the Threshold Limit Value (TLV-TWA), as published by WORKSAFE [1995], for some of the individual constituents is listed below.

**LIQUID PETROLEUM HYDROCARBONS**

TLV-TWA : 100 ppm, 525 mg/m<sup>3</sup>

Exposure to liquid hydrocarbons at or below the recommended TLV-TWA and STEL is thought to minimise the risk of irritant effects and to produce neither significant narcosis or chronic injury.

**ACETONE**

TLV-TWA : 500 ppm (1,188 mg/m<sup>3</sup>) maximum A4

STEL : 750 ppm (1,782 mg/m<sup>3</sup>)

TWA (NIOSH) : 250 ppm ( 590 mg/m<sup>3</sup>)

PEL (FINAL) (OSHA) : 1,000 ppm (2,400 mg/m<sup>3</sup>)

IDLH Level (Immediate Danger to Life and Health) : 2,500 ppm [LEL]

SATURATION VAPOUR CONCENTRATION : 237,000 ppm @ 20°C

ODOUR THRESHOLD LEVEL : 3.6 ppm (detection), 699 ppm (recognition)

The odour threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

NOTE : This substance has been classified by the ACGIH as A4 NOT classifiable as causing Cancer in humans.

Half-life of Acetone in blood is 3 hours, which means that no adjustment for shift length has to be made with reference to the standard 8 hour/day, 40 hours per week because body clearance occurs within any shift with low potential for accumulation.

A STEL has been established to prevent excursions of Acetone vapours that could cause depression of the central nervous system.

NOTE : Detector tubes measuring in excess of 40 ppm, are available.

Exposure at or below the recommended TLV-TWA is thought to protect the worker against mild irritation associated with brief exposures and the bio-accumulation, chronic irritation of the respiratory tract and headaches associated with long-term Acetone exposures.

**STYRENE MONOMER (STABILIZED)**

ES-TWA : 50 ppm (215 mg/m<sup>3</sup>) / STEL 100 ppm (428 mg/m<sup>3</sup>)

TLV-TWA : 20 ppm ( 85 mg/m<sup>3</sup>) / STEL 40 ppm (170 mg/m<sup>3</sup>) A4

ODOUR THRESHOLD LEVEL : 0.009 ppm (detection), 0.05 0.96 ppm (recognition)

The odour threshold only serves as a warning of exposure. Not smelling it does not mean you are not being exposed.

High concentrations will cause eye, nose, and throat irritation, dizziness and light-headedness.

**POTENTIAL HEALTH EFFECTS**

: SKIN: Product contains components that may be absorbed through, and irritating to skin.

Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

: EYES: Liquid and vapour are very irritating to the eyes.

Exposure by inhalation may cause respiratory irritation, and central nervous system depression known as "styrene sickness".

NOTE : This substance has been classified by the ACGIH as A4 NOT classifiable as causing cancer in humans.

**8. EXPOSURE CONTROLS - continued****EXPOSURE LIMITS (continued)****4-TERT-BUTYL CATECHOL (TBC) (INHIBITOR)**CEL-TWA : 5 mg/m<sup>3</sup>

Severely irritating, can cause allergic dermatitis and can de-pigment skin.

**FUMED SILICA (Amorphous - containing no asbestos and < 1% crystalline silica )**TLV-TWA (ACGIH) : 6 mg/m<sup>3</sup> - Inhalable dustTLV-TWA : 2 mg/m<sup>3</sup> - Respirable dust

Carcinogenic Effects : 3 (Not classifiable for human.) by IARC.

Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

**TITANIUM DIOXIDE**TLV-TWA : 10 mg/m<sup>3</sup> Total Dust, 8 hour**MINERAL FILLERS / EXTENDERS**TLV-TWA : 10 mg/m<sup>3</sup> Total Dust, 8 hour**NOTE**

The above TLV's are issued as guidelines only in the control of occupational health hazards and should not be interpreted as the fine line between safe and dangerous conditions.

The above exposure limits are for air levels only.

When skin contact also occurs, you may be overexposed, even though air levels are less than the limits listed above.

Exposure limits with "skin" notation indicate that vapour and liquid may be absorbed through intact skin.

Absorption by skin may readily exceed vapour inhalation exposure.

Symptoms for skin absorption are the same as for inhalation.

Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

Follow applicable regulations. (refer WORKSAFE Australia Exposure Standards).

As with chemical ingestion, inhalation of vapour, prolonged or repeated skin contact should be avoided by good occupational work practice.

All contact with this chemical should be reduced to the lowest possible level.

All atmospheric contamination should be kept to as low a level as is practically possible.

Take this Fact Sheet with you.

**HOW TO DETERMINE IF YOU ARE BEING EXPOSED**

Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and air samples.

You have a legal right to obtain copies of sampling results from your employer.

If you think you are experiencing any work related health problems, see a doctor trained to recognize occupational diseases.

Take this MSDS with you.

**8. EXPOSURE CONTROLS - continued****EXPOSURE LIMITS - continued**

**TLV-TWA** is the time weighted average airborne concentration of the workplace atmosphere for a normal 8 hour work day and a 40 hour work week, to which nearly all workers may be repeatedly exposed day after day without adverse effect.

These TLV's are issued as guidelines only and should not be interpreted as the fine dividing line between safe and dangerous concentrations of chemicals and/or conditions.

They are not a measure of relative toxicity.

All atmospheric contamination should be kept to as low a level as is practically possible.

**STEL's** are expressed as airborne concentrations of substances, averaged over a period of 15 minutes.

This short term TWA concentration should not be exceeded at any time during a normal 8 hour working day.

Workers should not be exposed at the STEL concentration continuously for longer than 15 minutes, or for more than four such periods per working day.

A minimum of 60 minutes should be allowed between successive exposures at the STEL concentration.

**STEL** is the concentration to which workers can be exposed continuously for a short period of time without suffering from :

- irritation
- chronic or irreversible tissue damage, or
- narcosis of a sufficient degree to increase the likelihood of accidental injury, impair self-rescue or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded.

**Sk NOTICE** - absorption through the skin, mucous membranes and eye may be a significant source of exposure.

The exposure standard is invalidated if such contact should occur.

Exposure limits with "skin" notation indicate that vapour and liquid may be absorbed through intact skin.

Absorption by skin may readily exceed vapour inhalation exposure.

Symptoms for skin absorption are the same as for inhalation.

Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

**PEAK LIMITATION** - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.

**IDLH** - Immediate Danger to Life and Health.

**ODOUR THRESHOLD**

When considering the odour threshold of a substance, one finds that reported values are widely divergent.

Two major factors which influence odour detection are differences between individuals in the ability to perceive a particular odour and the methodology employed in conducting the odour threshold determination.

In their "Guide to Industrial Respiratory Protection - Appendix C" , NIOSH states:

Amoore and Hautala (33) found that on average, 95% of a population will have a personal odour threshold that lies within the range from about one-sixteenth to sixteen times the reported mean "odour threshold" for a substance.

In further explanation, Amoore and Hautala state:

The ability of members of the population to detect a given odour is strongly influenced by the innate variability of different persons' olfactory powers, their prior experience with that odour, and by the degree of attention they accord the matter.

**8. EXPOSURE CONTROLS - continued****PERSONAL PROTECTION****WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT.**

However, for some jobs personal protective equipment may be appropriate.

Eye wash fountains and safety showers should be available for emergency use.

In case of hypersensitivity of the respiratory tract and skin (e.g. asthmatics and those who suffer from chronic bronchitis and chronic skin complaint) it is inadvisable to work with this product.

Use adequate general or local exhaust ventilation to meet TLV requirements.

Skin contact should be avoided by wearing chemically resistant work clothing, boots and gloves.

All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Contact lenses should NOT be worn in areas where eye contact with this product can occur.

Observe good personal hygiene.

Keep away from foodstuffs, drinks and tobacco.

Keep working clothes separate.

Take off immediately all contaminated clothing.

Launder contaminated clothing and other protective equipment before storing or re-using, and discard internally contaminated gloves and footwear.

ALWAYS wash hands before eating, drinking, smoking, using the toilet, before breaks and at end of work.

Do NOT eat, smoke, or drink where this product is handled, processed, or stored, since the chemical can be swallowed.

Personal protective equipment should NOT be worn in lunch areas to prevent migration of this product to an area where other employees may be unknowingly exposed.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult your Occupational Health and Safety Adviser.

For detailed advice on Personal Protective Equipment, refer to the following Australian Standards :-

HB 9 (Handbook 9)	Manual of industrial personal protection.
AS 1377	Eye protectors for industrial applications.
AS 1715	Selection, use and maintenance of respiratory protective devices.
AS 1716	Respiratory protective devices.

When exposure is likely, personal protective equipment in combination appropriate to the degree and nature of exposure, should be selected from the following lists :-

**SKIN**

Prolonged or repeated skin contact should be avoided by using barrier cream and wearing impervious, chemically resistant work clothing (PVC apron and sleeves or full PVC covering), safety boots and protective gloves (polyethylene, Butyl rubber, Neoprene, Polyvinyl Alcohol, PE/EVOH/PE, nitrile or PVC).

Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing for your operation. Final glove selection should be made by knowledgeable individuals based on the specific circumstances involved.

Protective suit may be required if exposure severe.

All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.

Do NOT use solvents to clean the skin but use skin cleansing cream.

Ensure that there is ready access to an emergency shower.

Wash skin thoroughly with soap and water after contact to remove the chemical.

If gross contamination occurs, IMMEDIATELY wash or shower to remove the chemical and remove all contaminated clothing and change into clean clothing.

Clothing wet with product should be soaked with water before removal to prevent the possibility of ignition by static electricity discharges.

Remove contaminated shoes, thoroughly dry before re-use.

At the end of the work shift, wash any areas of the body that may have contacted this product, whether or not known skin contact has occurred.

Launder contaminated clothing and other protective equipment before storing or re-using, and discard internally contaminated gloves and footwear.

Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to this product.

**8. EXPOSURE CONTROLS - continued****PERSONAL PROTECTION - continued****RESPIRATORY**

Avoid breathing vapours.

Engineering controls must be effective to ensure that exposure to this chemical does not occur.

Enclose operations and use local exhaust ventilation to meet TLV requirements.

If local exhaust ventilation or enclosure is not used, respirators should be worn.

Respiratory protection required if airborne concentration exceeds TLV.

Respiratory protection required in insufficiently ventilated working areas and during spraying.

If the possibility of exposures the recommended limits exists, use an approved self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716) with a full facepiece operated in continuous flow or other positive pressure mode.

Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in the appropriate regulations.

**IMPROPER USE OF RESPIRATORS IS DANGEROUS.**

<u>Breathing Zone Level</u> <u>ppm (volume)</u>	<u>Maximum Protection</u> <u>Factor</u>	<u>Half-Face</u> <u>Respirator</u>	<u>Full-Face</u> <u>Respirator</u>
1,000	10	AB-AUS P-	
1,000	50	-	AB-AUS P-
5,000	50	Airline *	-
5,000	100	-	AB-2 P-
10,000	100	-	AB-3 P-
10,000	100+	-	Airline **

\* - Continuous Flow

\*\* - Continuous Flow or Positive Pressure Demand

Use an approved full face-piece respirator with organic vapour canister or supplied-air respiratory protection in confined or enclosed spaces and/or where the potential exists for exposures over 250 ppm.

At concentrations up to 250 ppm, a chemical cartridge respirator with organic vapour/acid mist cartridge is recommended.

Correct respirator fit is essential to obtain adequate protection.

Above this level, a self-contained breathing apparatus (meeting the requirements of AS1715 and AS1716) is recommended.

If vapour causes eye irritation or if an inhalation risk exists an air supplied breathing apparatus with a full face piece operated in the positive pressure mode or with a full face-piece, hood, or helmet in the continuous flow mode (meeting the requirements of AS1715 and AS1716) should be used.

If while wearing a filter, cartridge or canister respirator, you can smell, taste, or otherwise detect this product, or in the case of a full facepiece respirator you experience eye irritation, leave the area IMMEDIATELY.

Check to make sure the respirator to face seal is still good.

If it is, replace the filter, cartridge, or canister.

If the seal is no longer good, you may need a new respirator.

Where the concentration of vapour or mist is unknown or expected to approach or exceed the Worksafe Exposure Standards limit, the following additional equipment is recommended :-

(1) Short elevated exposures, e.g. spillage - goggles and correct respiratory equipment should be worn.

N.B. if the vapour/mist concentration exceeds the exposure limit by more than 10 times, air supplied apparatus should be used.

(2) For prolonged elevated exposures - Full face air supplied or self contained breathing apparatus should be worn.

NOTE : Make sure the correct cartridges are used for the potential air contamination.

The effectiveness of an air purifying respirator is limited.

Use it only for a single, short term exposure.

For emergency and other conditions where the exposure guide line may be greatly exceeded, use an approved, positive pressure, self-contained breathing apparatus and an observer present for assistance.

For further information consult your Occupational Health and Safety Adviser.

**8. EXPOSURE CONTROLS - continued****PERSONAL PROTECTION - continued****RESPIRATORY - continued**

Be sure to consider all potential exposures in your workplace.

You may need a combination of filters, pre-filters, cartridges, or canisters to protect against different forms of a chemical (such as vapour and mist) or against a mixture of chemicals.

Exposure to 1,000 ppm is immediately dangerous to life and health.

If the possibility of exposures above 1,000 ppm exists, use an approved self contained breathing apparatus with a full face-piece (meeting the requirements of AS1715 and AS1716) operated in continuous flow or other positive pressure mode.

Where the concentration of vapour or mist is unknown or expected to approach or exceed the Worksafe Exposure Standards limit, the following additional equipment is recommended :-

(1) Short elevated exposures, e.g. spillage - goggles and correct respiratory equipment should be worn.

N.B. if the vapour/mist concentration exceeds the exposure limit by more than 10 times, air supplied apparatus should be used.

(2) For prolonged elevated exposures - Full face air supplied or self contained breathing apparatus should be worn.

**NOTE** : Make sure the correct cartridges are used for the potential air contamination.

The effectiveness of an air purifying respirator is limited.

Use it only for a single, short term exposure.

For emergency and other conditions where the exposure guide line may be greatly exceeded, use an approved, positive pressure, self-contained breathing apparatus and an observer present for assistance.

For further information consult your Occupational Health and Safety Adviser.

**EYES**

Eyes should be protected by chemical splash goggles, safety glasses fitted with side shields or full face shield unless full face-piece respiratory protection is worn..

Contact lenses should NOT be worn as soft lenses may absorb irritants and all lenses concentrate irritants.

If vapour causes eye irritation or if an inhalation risk exists a full-face, organic vapour respirator (meeting the requirements of AS1715 & AS1716) should be used.

Eye wash fountains (capable of maintaining an appropriate water pressure for an appropriate length of time to remove the product from the eyes) and safety showers should be available for emergency use.

**9. PHYSICAL and CHEMICAL PROPERTIES****PHYSICAL DESCRIPTION / PROPERTIES**

APPEARANCE		: White, viscous liquid.	
ODOUR		: Strong hydrocarbon odour.	
pH VALUE		: Not applicable	
VAPOUR PRESSURE	(kPa @ 25°C)	: 30.0	(Acetone)
RELATIVE VAPOUR DENSITY		: 2.00	(Air = 1) (Acetone)
BOILING POINT	(°C)	: 56.2	(Acetone)
FREEZING POINT	(°C)	: Not Available	
SOLUBILITY IN WATER		: Negligible	
SOLUBILITY		: Soluble in many organic solvents.	
SPECIFIC GRAVITY	(@ 25°C)	: 1.240 ± 0.010	(Water =1)
FLASH POINT	(°C)	: < 0.0	(Tag Closed Cup) (Acetone)
FLAMMABILITY LIMITS		: 3.0 LEL / 13.0 UEL (% Volume)	(Acetone)
AUTOIGNITION TEMPERATURE		: 490.0 °C	(Styrene)
VOC CONTENT		: 245 ± 5 gm / Litre	
EVAPOURATION RATE		: 7.7	(Butyl Acetate =1) (Acetone)
% VOLATILES	(by volume)	: 30.5 ± 0.5 %	
Octanol/Water Partition Coefficient Log P (oct)		: 2.95	(Styrene)

OTHER PROPERTIES : Flammable, vapours can readily form explosive mixture with air

**10. STABILITY and REACTIVITY****REACTIVITY / COMPATIBILITY**

- Hazardous polymerization : May occur at elevated temperatures.  
Polymerization may be accompanied by generation of heat as exotherm.  
Process is self-accelerating as heating causes more rapid polymerization.
- Stability : Stable under normal conditions  
Contains a stabilizer/polymerization inhibitor system that provides workable but not indefinite shelf life.
- Conditions to Avoid : Heat, sparks, flame and build up of static electricity.
- Incompatibility (materials to avoid for purpose of transport, handling & storage only)  
: Avoid contact with water, rust, strong alkalis, mineral acids, halogens, amines, alkanolamines, aldehydes, ammonia, strong oxidizers (liquid chlorine, bromine, fluorine, concentrated oxygen, sodium hypochlorite, perchloric acid, chromium trioxide, peroxides, chlorates, perchlorates, nitrates, & permanganates - increased risk of fire), alkylation catalysts, alkali metal hydroxides (hydrolysis can occur), rubber, polyethylene and PVC, copper and copper alloys, and most tank linings.
- Hazardous reactions : Acetone reacts violently with bromoform and chloroform in the presence of alkalis.  
It decomposes in contact with nitric/sulphuric acid mixtures.  
Incompatible with oxidizing agents, strong acids, chloroform, and activated carbon.
- Hazardous components of mixtures : No unusual.
- Hazardous decomposition products : No hazardous decomposition products when stored and handled correctly.  
Forms toxic fumes when thermally decomposed.  
Thermal decomposition is dependent on time and temperature.
- Hazardous combustion products : Carbon monoxide and/or carbon dioxide, oxides of silicone, oxides of metal, fumes and smoke in the case of incomplete combustion.  
Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.

**11. TOXICOLOGICAL INFORMATION****TOXICITY**

Harmful if swallowed, may cause gastric irritation and narcosis.

Do NOT induce vomiting if swallowed

Prolonged, repeated skin contact with low viscosity materials may de-fat the skin resulting in possible irritation and dermatitis.

High vapour concentrations are irritating to the respiratory tract may cause nausea, vomiting, headache, dizziness anaesthetic and may have other central nervous system effects.

Limits shown for guidance only.

Follow applicable regulations (refer WORKSAFE Australia Exposure Standards).

**ACETONE**

Oral	LD <sub>50</sub>	(rat)	: 5,800 - 8393	mg/kg.	Moderately toxic.
Oral	LD <sub>50</sub>	(mouse)	: 3,000	mg/kg	
Oral	LD <sub>50</sub>	(rabbit)	: 5,340	mg/kg	
Oral	Lowest Toxic Dose	(man)	: 2,857	mg/kg	- Coma
Dermal	LD <sub>50</sub>	(rabbit)	: > 15,688	mg/kg (no deaths recorded)	Practically non-toxic.
Dermal	LD <sub>50</sub>	(rat)	: 20,000	mg/kg.	Practically non-toxic.
Dermal	LD <sub>50</sub>	(guinea pig)	: > 9.400	µL/kg	
Oral	TDL <sub>0</sub>	(rat)	: 273	gm/kg	; Reproductive - Paternal Effects
Inhalation	LC <sub>50</sub>	(rat)	: 50,100	mg/m <sup>3</sup> / 8 hours	Moderately toxic.
Inhalation	LC <sub>50</sub>	(mouse)	: 44,000	gm/m <sup>3</sup> / 4 hours	
Inhalation	Lowest Toxic Concentration	(human)	: 12,000	ppm / 4 hours	
					- nausea or vomiting; muscle weakness.
Inhalation		(human)			: Irritating to nose and throat, will cause nausea, vomiting, headache, dizziness. Vapour concentrations above 500 ppm are irritating to the nose and throat. High concentrations above 1000 ppm has resulted in narcotic effects.
Skin		(rabbit)	: 500	mg / 24 hours - Standard Draize Test	- Mild Irritating to skin. If allowed to remain, may cause smarting and reddening of the skin. Not readily absorbed.
Skin		(human)	: 500	mg / 7days (Mild)- Standard Draize Test	Subjects exposed to vapour concentrations of 500 - 1000 ppm experienced irritation to the eyes.
Eye		(rabbit)	: 20	mg	- Draize test - Severe
Swallowed					: Harmful if swallowed, may cause gastric irritation and narcosis.
Carcinogenicity					: ACGIH: A4 - Not Classifiable as a Human Carcinogen
Neurotoxicity					: No information available.
Mutagenicity: Sex chromosome loss and non-disjunction (Yeast - Saccharomyces cerevisiae)			: 47,600	ppm	
Cytogenetic analysis (Rodent - hamster Fibroblast)			: 40	gm/L	

**STYRENE MONOMER (STABILIZED)**

Oral	LD <sub>50</sub>	(rat)	: 5,000	mg/kg.	
Inhalation	LC <sub>50</sub>	(rat)	: 24,000	mg/m <sup>3</sup> / 4 hours	
Inhalation	LC <sub>LO</sub>	(human)	: 10,000	ppm / 30minutes	
Inhalation	TC <sub>LO</sub>	(human)	: 600	ppm.	
Inhalation		(human)			: Irritating to nose and throat, will cause nausea, vomiting, headache, dizziness.
Skin		(rabbit)			: May cause moderate irritation on prolonged or repeated contact. If allowed to remain, may cause smarting and reddening of the skin.
Eye		(rabbit)			: Can cause strong-moderate irritation.
Carcinogenicity					: Potential Carcinogen

Chronic or prolonged styrene overexposure may cause neurological defects and impaired lung, kidney, and liver function.

Prolonged skin contact may produce dermatitis.

**11. TOXICOLOGICAL INFORMATION - continued****TOXICITY (continued)****4-TERT-BUTYL CATECHOL**

Oral	LD <sub>50</sub>	(rat)	:	2,820 mg/kg.
Dermal	LD <sub>50</sub>	(rabbit)	:	630 mg/kg.
Eye		(rabbit)	:	Can cause severe irritation.
Skin		(rabbit)	:	Can cause severe irritation.

**AROMATIC PETROLEUM HYDROCARBONS**

Oral	LD <sub>50</sub>	(rat)	:	2,900 mg/kg
Dermal	LD <sub>50</sub>	(rabbit)	:	10,500 mg/kg
Inhalation	LC <sub>50</sub>	(rat)	:	12,100 mg/m <sup>3</sup> /8 hours
Eyes		(rabbit)	:	Moderate Irritant
Respiratory Irritation			:	Repeated inhalation of vapours and mists is expected to cause irritation of the respiratory tract.
Skin			:	Harmful
Other			:	Harmful if swallowed or by inhalation.

Evidence from animal tests is available to indicate that repeated or prolonged exposure to hydrocarbon solvents could result in liver, kidney and central nervous disorders as well as anaemia and leukopenia (lowered white cell count).

Aromatic hydrocarbons irritate the skin and mucous membranes and are narcotic if inhaled in high concentrations.

Chronic exposure to high concentrations of Benzene have been associated with blood abnormalities and leukaemia in a small percentage of exposed workers.

**FUMED SILICA (Amorphous - containing no asbestos and < 1% crystalline silica )**

Acute Oral	LD <sub>50</sub>	(rat)	:	> 10,000 mg/kg
Acute Inhalation	LC <sub>50</sub>	(rat)	:	0.139 mg/L / 4 hours (maximum concentration attainable in experiments)
Acute Dermal	LD <sub>50</sub>	(rabbit)	:	> 5,000 mg/kg - No deaths occurred.
Skin Irritation		(rabbit)	:	Not irritating
Eye Irritation		(rabbit)	:	Not irritating
Repeated dose toxicity		Oral	:	No negative effects
Repeated dose toxicity		Inhalative	:	No irreversible changes and no indication of silicosis.
Gentotoxicity		(in vitro)	:	No evidence of mutagenic effects, literature
Carcinogenicity			:	3 (Not classifiable for human) by IARC
Toxicity to reproduction			:	No negative effects
Human experience			:	Silicosis or other product specific illnesses of the respiratory tract were not observed in association with the product. Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation. No chronic (long term) effects are known for humans.

**TITANIUM DIOXIDE**

Oral	LD <sub>50</sub>	(rat)	:	> 10,000 mg/kg
Dermal	LD <sub>50</sub>	(rabbit)	:	> 10,000 mg/kg
Inhalation	LC <sub>50</sub>	(rat)	:	> 6.8 mg/L / 4 hours - Low toxicity

**11. TOXICOLOGICAL INFORMATION - continued****TOXICITY (continued)****SPECIAL PROPERTIES / EFFECTS**

Effects of this product on human health and the environment depend on how much of the product is present and the length and frequency of exposure.

Effects also depend on the health of a person or the condition of the environment when exposure occurs.

Over-exposure, especially during spraying operations without the necessary precautions entails the risk of concentration-dependent irritating effects on eyes, nose, throat, and respiratory tract and can adversely affect the nervous system.

Effects range from headaches, dizziness, nausea, and numbness in fingers and toes to unconsciousness and death.

Delayed appearance of the complaints and development of hyper-sensitivity (difficult breathing, coughing, asthma) are possible.

Direct, prolonged contact with liquid product irritates the skin. The liquid also irritates the eyes.

Human health effects associated with breathing or otherwise consuming smaller amounts of the product over long periods of time are not known.

Vapour at concentrations above the exposure standard has an anaesthetic effect, which may lead to headache, dizziness and loss of consciousness.

This chemical has not been adequately evaluated to determine whether brain or other nerve damage could occur with repeated exposure.

However, many solvents and other petroleum-based chemicals have been shown to cause such damage.

Effects may include reduced memory and concentration, personality changes (withdrawal, irritability), fatigue, sleep disturbances, reduced coordination, and/or effects on nerves supplying internal organs (autonomic nerves) and/or nerves to the arms and legs (weakness, "pins and needles").

Over-exposure, especially during spraying operations without the necessary precautions entails the risk of concentration-dependent irritating effects on eyes, nose, throat, and respiratory tract.

Delayed appearance of the complaints and development of hyper-sensitivity (difficult breathing, coughing, asthma) are possible.

Hypersensitive persons may suffer from these effects even at low concentrations below the TWA-limit.

**12. ECOLOGICAL INFORMATION**

This product may enter the environment from industrial discharges, municipal waste treatment plant discharges, or spills. Do not allow to escape into waters, waste water or soil.

**ACETONE****ENVIRONMENTAL IMPACT - ECOTOXICITY IN WATER**

Rainbow trout	LC <sub>50</sub>	: 5,540 mg/L / 96 hours
Rainbow trout	LC <sub>50</sub>	: 6,100 mg/L / 24 hours
Daphnia magna	LC <sub>50</sub>	: 10,000 mg/L / 96 hours
Fingerling Trout	LC <sub>50</sub>	: 6,100 mg/L / 24 hours (flow through)
Fathead Minnow	LC <sub>50</sub>	: 7,500 mg/L / 96 hours
Sunfish (tap water)	LC <sub>50</sub>	: 14,250 ppm / 24 hours
Bluegill Sunfish	LC <sub>50</sub>	: 8,300 mg/L / 96 hours
Guppy (Poecilia reticular)	LC <sub>50</sub>	: 7,032 ppm / 14 days
Water Flea	LC <sub>50</sub>	: 0.1 ppm any hours
Mosquito fish (turbid water)	TLm	: 13,000 ppm / 48 hours
Pseudomonas Putida	ICO	: 1,700 mg/L

BOD5 : approx 1.92 g O<sup>2</sup>/gCOD : approx 1.76 g O<sup>2</sup>/g

ECOTOXICITY : The product is not expected to be toxic to aquatic organisms.

MOBILITY : The product is soluble in water.

BIOACCUMULATION : The product is not bio-accumulating.

DEGRADABILITY : The product is easily biodegradable.

**STYRENE MONOMER (STABILIZED)****ENVIRONMENTAL IMPACT - ECOTOXICITY IN WATER**

Fathead Minnow	LC <sub>50</sub>	: 4.20 mg/L / 96 hours (flow-through)
Bluegill	LC <sub>50</sub>	: 25.05 mg/L / 96 hours (static)
Goldfish	LC <sub>50</sub>	: 64.74 mg/L / 96 hours (static)
Water Flea	EC <sub>50</sub>	: 23.00 mg/L / 48 hours
Photobacterium phosphoreum	EC <sub>50</sub>	: 5.40 mg/L / 5 minutes

BCF (bioconcentration factor) in goldfish : 13.5 (measured) - suggests low bio-concentrating potential.

BOD5 : 1.29 g O<sup>2</sup>/gBOD20 : 2.45 g O<sup>2</sup>/g

GENERAL MATERIAL INFORMATION : Toxic to aquatic life.

**ENVIRONMENTAL FATE / MOBILITY**

The atmospheric half-life for styrene vapour is estimated between 0.5 and 17 hours.

Styrene is primarily removed by photochemical reactions in air and evaporation in water.

The half-life in moving water has been estimated at approximately 6 hours and in ponds and leaks it ranges from 3 to 13 days.

In soils with high organic content, styrene moves slowly.

It will volatilize from surface soil at a much slower rate than from water.

DEGRADABILITY : The product is readily biodegradable in surface water.  
: In groundwater, the rate of biodegradation is slow (half-life between 6 and 32 weeks).  
: Sub-surface biodegradation accounts for more styrene loss than volatilization.BIOACCUMULATION/ACCUMULATION: Styrene will partition from water to organisms, depositing in fatty tissues.  
Elimination is rapid and not likely to bio-concentrate through the food chain.

**12. ECOLOGICAL INFORMATION - continued****FUMED SILICA** (Amorphous - containing no asbestos and < 1% crystalline silica )**ACUTE TOXICITY**

LC <sub>50</sub>	: > 10,000 mg / L / 96 hours	(Brachydanio rerio)
EC <sub>50</sub>	: > 10,000 mg / L / 24 hours	(Daphnia magna)

Bioaccumulation : According to experience not expected.  
Mobility : Not expected to migrate.  
Persistence & Degradability : The methods for determining biodegradability are not applicable to inorganic substances.  
Solubility : Insoluble in water.  
Products of Biodegradation : Possibly hazardous short term degradation products are not likely.  
However, long term degradation products may arise.  
Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

No expected damaging effects to aquatic organisms.

Effects in sewage treatment plants (bacteria toxicity : respiration-/reproduction inhibition):  
According to current knowledge adverse effects on water purification plants are not expected.  
Can be removed mechanically from waste water.

**ACUTE (SHORT-TERM) ECOLOGICAL EFFECTS**

Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants.  
Acute effects are seen two to four days after animals or plants come in contact with a toxic chemical substance.  
This product has high acute toxicity to aquatic life and causes injury to various agricultural and ornamental crops.  
Insufficient data are available to evaluate or predict the short-term effects of this product to birds or land animals.

**CHRONIC (LONG-TERM) ECOLOGICAL EFFECTS**

Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior.  
Chronic effects can be seen long after first exposure(s) to a toxic chemical.  
This product has high chronic toxicity to aquatic life.  
Insufficient data are available to evaluate or predict the long-term effects of this product to plants, birds, or land animals.

**WATER SOLUBILITY**

This product is moderately soluble in water. Concentrations of between 1 to 1,000 milligrams will mix with a litre of water.

**ENVIRONMENT PROTECTION** : Do not allow to enter waters, waste water, or soil.

**DISTRIBUTION AND PERSISTENCE IN THE ENVIRONMENT**

This product is non-persistent in water.  
The product is expected to be moderately persistent in water, with a half-life of than 2 - 20 days.  
The half-life of a pollutant is the amount of time it takes for one-half of the chemical to be degraded.  
About 99.3% of the solvents in this product will eventually end up in the air; about 0.5% will end up in water; about 0.1%, respectively will end up in terrestrial soils and in aquatic sediments.

**BIOACCUMULATION IN AQUATIC ORGANISMS**

Some substances increase in concentration, or bio-accumulate, in living organisms as they breathe contaminated air, drink contaminated water, or eat contaminated food.  
These chemicals can become concentrated in the tissues and internal organs of animals and humans.  
The concentration of this product found in fish tissues is expected to be somewhat higher than the average concentration of this product in the water from which the fish was taken.

**ABIOTIC EFFECTS**

Styrene reacts with ozone with an estimated half-life of 9 hours.  
The chemical is also a generator of photochemical smog due to indirect photochemical reactions (Howard 1989).



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**13. DISPOSAL CONSIDERATIONS**

This product is NOT suitable for disposal by either landfill or via municipal sewers, drains, natural streams or rivers.  
Consult an expert on disposal of any recovered material and ensure conformity to local disposal regulations.  
It may be necessary to contain and dispose of this product as a HAZARDOUS WASTE.  
Contact your state Environmental Program for specific recommendations.  
Refer to State Land Waste Management Authority for specific recommendations.  
Advise of flammable/chemical nature.  
Recycle product where possible.  
Recycle containers where possible, or dispose of in an authorised landfill.  
Do NOT pressurise, cut, heat, or weld containers.  
Do NOT re-use empty containers without commercial cleaning or reconditioning.  
Empty product containers may contain product residue.

**14. TRANSPORT INFORMATION**

Classified as a Dangerous Good (Class 3) (FLAMMABLE LIQUID) Dangerous Substance for the purpose of transport.  
Refer to relevant regulations for storage and transport requirements.

**STORAGE AND TRANSPORT**

Classified as a Dangerous Good (Class 3) for transport purposes.

SHIPPING NAME	: Paint Related Material		
UN No	: 1263	PACKAGING GROUP	: II
CLASS	: 3 (Flammable Liquid )	AS 1940 Class	: PG II
SUBSIDIARY RISK	: NOT ASSIGNED	HAZCHEM CODE	: •3YE
EPG	: 3A1		
STORAGE TEMPERATURE	(°C) : Ambient		
TRANSPORT TEMPERATURE	(°C) : Ambient		
LOADING / UNLOADING TEMPERATURE	(°C) : Ambient		
STORAGE / TRANSPORTATION PRESSURE (kPa)	: Atmospheric		
ELECTROSTATIC ACCUMULATION HAZARD ?	: Yes, use proper grounding procedure.		
USUAL SHIPPING CONTAINERS	: Pails, cans.		
MATERIALS AND COATINGS SUITABLE	: Carbon Steel / Stainless Steel.		
MATERIALS AND COATINGS UNSUITABLE	: Natural Rubber / Butyl Rubber / E P D M / Polystyrene / Polyethylene / Polypropylene / Polyvinyl chloride / Polyvinyl alcohol / Polyacrylonitrile		

Class 3 flammable liquids shall NOT be loaded in the same vehicle with :-

- Class 1 Explosives
- Class 2.1 Flammable gases (when both in bulk)
- Class 2.3 Poisonous gases
- Class 4.2 Spontaneously combustible substances
- Class 5.1 Oxidizing agents
- Class 5.2 Organic peroxides
- Class 7 Radioactive substances
- Halogens (chlorinated compounds & etc.)
- Foodstuffs and foodstuff empties.

Refer to Australian Code for the Transport of Dangerous Goods By Road and Rail (8<sup>th</sup> Edition) for transport regulations and state Dangerous Goods regulations for storage requirements.

This material is a Scheduled Poison (S5) and must be stored, maintained and used in accordance with the relevant regulations.

Materials are stable on storage, but should be stored in a cool, well ventilated area away from sources of ignition, oxidizing agents and odor sensitive materials.

Keep containers tightly closed when not in use and check regularly for leaks.

Use non-sparking tools and equipment.

HARMFUL IF INHALED.

CAUSES EYE IRRITATION.

BREATHING OF MIST MAY CAUSE LUNG DAMAGE.

**15. REGULATORY INFORMATION**

Leaks of gas or spills of liquid can readily form flammable mixtures at temperatures at or above flash point.

**Hazardous according to criteria of Worksafe Australia**

**CLASSIFICATION AND LABELLING ACCORDING TO NOHSC CODES**

CLASSIFICATION / SYMBOL : HIGHLY FLAMABLE / F  
CLASSIFICATION / SYMBOL : HARMFUL / Xn - IRRITANT / Xi  
GOVERNING DIRECTIVE : National Code of practice for the Labelling of Hazardous Substances.  
LABEL NAME : Paint Related Material, LFP

**HAZARDS IDENTIFICATION****RISK PHRASES**

R11 Highly flammable.  
R18 In use, may form flammable/explosive vapour-air mixture.  
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.  
R33 Danger of cumulative effects.  
R36/37/38 Irritating to eyes, respiratory system and skin.  
R42/43 May cause sensitization by inhalation and skin contact.  
R66 Repeated exposure may cause skin dryness or cracking.  
R65 May cause lung damage if swallowed.  
R67 Vapours may cause drowsiness and dizziness.

**SAFETY ADVICE**

S02 Keep out of the reach of children.  
S3/7/9 Keep container tightly closed in a cool, well ventilated place.  
S16 Keep away from sources of ignition - No smoking.  
S20/21 When using, do not eat, drink or smoke.  
S23 Do not breathe gas/fumes/vapour/spray  
S24/25 Avoid contact with skin and eyes.  
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S29 Do not empty into drains.  
S33 Take precautionary measures against static discharges.  
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.  
S43B In case of fire use sand, earth, chemical powder or alcohol type foam  
S45 In case of accident or if you feel unwell, seek medical advice immediately.  
(Show label or MSDS where possible).  
S51 Use only in well ventilated areas.  
S60 This material and its container must be disposed of as hazardous waste.  
S61 Avoid release into the environment.  
S62 If swallowed, do NOT induce vomiting.

**16. OTHER INFORMATION****LD<sub>50</sub>** (Lethal Dose, 50 %)

LD<sub>50</sub> is the amount of a material, given all at once, which causes the death of 50 % (one half) of a group of test animals.

The LD<sub>50</sub> is one way to measure the short-term poisoning potential (acute toxicity) of a material.

The LD<sub>50</sub> can be found for any route of entry or administration but dermal (applied to the skin) and oral (given by mouth) administration methods are the most common.

**LC<sub>50</sub>** (Lethal Concentration, 50 %)

LC values usually refer to the concentration of a chemical in air but in environmental studies it can also mean the concentration of a chemical in water.

For inhalation experiments, the concentration of the chemical in air that kills 50 % of the test animals in a given time (usually four hours) is the LC<sub>50</sub> value.

**EC<sub>50</sub>** (half maximal effective concentration)

refers to the concentration of a drug, antibody or toxicant which induces a response halfway between the baseline and maximum after some specified exposure time. It is commonly used as a measure of drug's potency.

**IC<sub>50</sub>** (half maximal inhibitory concentration)

is a measure of the effectiveness of a compound in inhibiting biological or biochemical function.

This quantitative measure indicates how much of a particular drug or other substance (inhibitor) is needed to inhibit a given biological process (or component of a process, i.e. an enzyme, cell, cell receptor or micro-organism) by half.

**TL<sub>M</sub>** (Median Tolerance Limit)

the concentration of toxicant or substance at which 50% of the test organisms survive over the test period.

**log Pow / log P(o/w)** in chemistry and the pharmaceutical sciences, a partition- (P) or distribution coefficient (D) is the ratio of concentrations of a compound in the two phases of a mixture of two immiscible solvents at equilibrium. Hence these coefficients are a measure of differential solubility of the compound between these two solvents. The phrase "Partition Coefficient" is now considered obsolete by IUPAC, and the appropriate alternative ("partition constant", "partition ratio" or "distribution ratio") should be used as appropriate.

Normally one of the solvents chosen is water while the second is hydrophobic such as octanol. Hence both the partition and distribution coefficient are measures of how hydrophilic ("water loving") or hydrophobic ("water fearing") a chemical substance is. A partition coefficient can also be used when one or both solvents is a solid though.

**THEORETICAL OXYGEN DEMAND (ThOD)**

is the calculated amount of oxygen required to oxidize a compound to its final oxidation products.

or

the amount of oxygen that theoretically can be consumed if the test substance is completely oxidized by micro-organisms.

Calculated from the test substance's chemical structure; units mg O<sub>2</sub> per mg of test substance.

**CHEMICAL OXYGEN DEMAND (COD)** test is commonly used to indirectly measure the amount of organic compounds in water. Most applications of COD determine the amount of organic pollutants found in surface water (e.g. lakes and rivers), making COD a useful measure of water quality.

It is expressed in milligrams per litre (mg/L), which indicates the mass of oxygen consumed per litre of solution.

Older references may express the units as parts per million (ppm).

**BIOCHEMICAL OXYGEN DEMAND (BOD)** is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period.

It is not a precise quantitative test, although it is widely used as an indication of the organic quality of water.

It is most commonly expressed in milligrams of oxygen consumed per litre of sample during 5 days of incubation at 20 °C and is often used as a robust surrogate of the degree of organic pollution of water.

BOD can be used as a gauge of the effectiveness of wastewater treatment plants.



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**16. OTHER INFORMATION - continued**

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**PRINCIPAL REFERENCES**

Supplier's Material Safety Data Sheet

In "Registry of Toxic Effects of Chemical Substances 1995" (Ed. D. Sweet),  
(US Dept. of Health & Human Services: Cincinnati 1995)

The components of this chemical is listed on the Australian Inventory of Chemical Substances (AICS).

In "Registry of Toxic Effects of Chemical Substances 1995" (Ed. D. Sweet),  
(US Dept. of Health & Human Services: Cincinnati 1995)