dentsply proroot mta root canal repair material

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

dentsply proroot mta root canal repair material

PRODUCT USE

Root canal repair material.

SUPPLIER

Company: Dentsply (AUSTRALIA) Pty Ltd
Address: 11-21 Gilby Road Mount Waverley, VIC, 3149
Emergency Tel: 1300 552 929
Tel: +61 3 9538 8240
Fax: +61 3 9538 8260
Website: www.dentsply.com.au

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to NOHSC Criteria, and ADG Code.

CHEMWATCH HAZARD RATINGS

<table>
<thead>
<tr>
<th>Category</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Toxicity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Body Contact</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chronic</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

POISONS SCHEDULE
None

RISK

Risk Codes Risk Phrases
R34 • Causes burns.
R41 • Risk of serious damage to eyes.
R51 • Toxic to aquatic organisms.
R58 • May cause long-term adverse effects in the environment.

SAFETY

Safety Codes Safety Phrases
S01 • Keep locked up.
S22 • Do not breathe dust.
S24 • Avoid contact with skin.
S25 • Avoid contact with eyes.
S36 • Wear suitable protective clothing.
S37 • Wear suitable gloves.
S39 • Wear eye/face protection.
S51 • Use only in well ventilated areas.
S59 • Keep container in a well ventilated place.
S401 • To clean the floor and all objects contaminated by this material, use water and detergent.
S27 • Take off immediately all contaminated clothing.
S26 • In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
S45 • In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
S63 • In case of accident by inhalation: remove casualty to fresh air and keep at rest.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>portland cement</td>
<td>65997-15-1</td>
<td>75</td>
</tr>
<tr>
<td>bismuth(III) oxide</td>
<td>1304-76-3</td>
<td>20</td>
</tr>
<tr>
<td>gypsum</td>
<td>13397-24-5</td>
<td>5-10</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- 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
Prevent concentration in hollows and sumps. Use in a well-ventilated area. Wear protective clothing when risk of exposure occurs. Avoid all personal contact, including inhalation.

**PROCEDURE FOR HANDLING**

- If contamination of drains or waterways occurs, advise Emergency Services.
- ALWAYS: Wash area down with large amounts of water and prevent runoff into drains. Vacuum/shovel up and place in labelled containers for disposal.
- IF DRY: Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. IF WET:
  - Recover product wherever possible.
  - Prevent, by any means available, spillage from entering drains or water courses.
  - Control personal contact by wearing protective clothing.
  - Alert Emergency Services and tell them location and nature of hazard.
  - CAUTION: Advise personnel in area.

**MAJOR SPILLS**

- Place in a suitable, labelled container for waste disposal.
- Use dry clean up procedures and avoid generating dust.
- Control personal contact by using protective equipment.

**FIRE/EXPLOSION HAZARD**

- Equipment should be thoroughly decontaminated after use.
- If safe to do so, remove containers from path of fire.
- Cool fire exposed containers with water spray from a protected location.
- DO NOT approach containers suspected to be hot.
- Use fire fighting procedures suitable for the surrounding area.
- Wear breathing apparatus plus protective gloves for fire only.
- Alert Fire Brigade and tell them location and nature of hazard.

**FIRE FIGHTING**

- Use extinguishing media suitable for the surrounding area.
- There is no restriction on the type of extinguisher which may be used.

**EXTINGUISHING MEDIA**

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for the surrounding area.
- 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.
- Equipment should be thoroughly decontaminated after use.

**FIRE INCOMPATIBILITY**

- May emit corrosive fumes.
- May emit poisonous fumes.
- Decomposition may produce toxic fumes of: silicon dioxide (SiO2), metal oxides.

- May emit poisonous fumes.
- May emit corrosive fumes.

**HAZCHEM**

- None known.

**NOTES TO PHYSICIAN**

- Treat symptomatically.
- Severe bismuth intoxication may be treated with dimercaptol (BAL in oil). Induction of acidosis by administration of ammonium chloride has been claimed to promote mobilisation of bismuth from tissue depots and increase the rate of urinary excretion.
- In mouse models D-penicillamine (Cuprimine M.S. & D) is a useful chelating agent. [Ellenhorn & Barceloux: Medical Toxicology].

---

**Section 5 - FIRE FIGHTING MEASURES**

**FIRE FIGHTING**

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for the surrounding area.
- 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.
- Equipment should be thoroughly decontaminated after use.

**FIRE INCOMPATIBILITY**

- May emit corrosive fumes.
- May emit poisonous fumes.
- Decomposition may produce toxic fumes of: silicon dioxide (SiO2), metal oxides.

**HAZCHEM**

- None known.

---

**Section 6 - ACCIDENTAL RELEASE MEASURES**

**MINOR SPILLS**

- Environmental hazard - contain spillage.
  - Remove all ignition sources.
  - Clean up all spills immediately.
  - Avoid contact with skin and eyes.
  - Control personal contact by using protective equipment.
  - Use dry clean up procedures and avoid generating dust.

**MAJOR SPILLS**

- Environmental hazard - contain spillage.
  - Moderate hazard.
  - CAUTION: Keep personnel in area.
  - Alert Emergency Services and tell them location and nature of hazard.
  - Control personal contact by wearing protective clothing.
  - Prevent, by any means available, spillage from entering drains or water courses.
  - Recover product wherever possible.
  - IF DRY: Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. IF WET: Vacuum/shovel up and place in labelled containers for disposal.
  - ALWAYS: Wash area down with large amounts of water 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 MSDS.**

---

**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**

- 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.
- DO NOT allow material to contact humans, exposed food or food utensils.
- 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. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

**SUITEABLE CONTAINER**
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

**STORAGE INCOMPATIBILITY**
Derivative of electronegative metal.
- Calcium oxide:
  - reacts violently with water, evolving high quantities of heat
  - reacts violently, with possible ignition or explosion, with acids, anilinium perchlorate, bromine pentafluoride, chlorine trifluoride, fluorine, hydrogen fluoride, hydrazine, hydrogen sulfide, hydrogen trisulfide, isopropyl isocyanide dichloride, light metals, lithium, magnesium, powdered aluminium, phosphorus, potassium, sulfur trioxide
  - increases the explosive sensitivity of azides, nitroalkanes (e.g. nitroethane, nitromethane, 1-nitropropane etc.)
  - is incompatible with boron trifluoride, carbon dioxide, ethanol, halogens (such as fluorine), metal halides, phosphorus pentoxide, selenium oxychloride, sulfur dioxide and many organic materials.
- Calcium sulfate:
  - reacts violently with reducing agents, acrolein, alcohols, chlorine trifluoride, diazomethane, ethers, fluorine, hydrazine, hydrazinium perchlorate, hydrogen peroxide, finely divided aluminium or magnesium, peroxycetic acid, red phosphorus, sodium acetate
  - sensitises most organic azides which are unstable shock- and heat-sensitive explosives
  - may form explosive materials with 1,3-di-(5-tetrazolyl)triazine
  - is incompatible with glycoll, isopropl chlorocarbonate, nitrosyl perchlorate, sodium borohydride
  - is hygroscopic; reacts with water to form gypsum and Plaster of Paris.
  - Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
  - These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
  - The state of subdivision may affect the results.
  - Segregate from alcohol, water.
  - Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.
  - Avoid contact with copper, aluminium and their alloys.
  - NOTE: May develop pressure in containers; open carefully. Vent periodically.

**STORAGE REQUIREMENTS**
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry area protected from environmental extremes.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations

For major quantities:
- Consider storage in bunded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams).
- Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.

**SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS**

- **X**: Must not be stored together
- **O**: May be stored together with specific preventions
- **+**: May be stored together

### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Source</th>
<th>Material</th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
<th>Peak ppm</th>
<th>Peak mg/m³</th>
<th>TWA F/CC</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia Exposure Standards</td>
<td>portland cement (Portland cement (a))</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(see Chapter 14)</td>
</tr>
<tr>
<td>Australia Exposure Standards</td>
<td>gypsum (Silica - Amorphous Fumed silica ( respirable dust))</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(see Chapter 14)</td>
</tr>
</tbody>
</table>

**ENDOELTABLE**
The following materials had no OELs on our records
- bismuth(III) oxide: CAS:1304-76-3

**EMERGENCY EXPOSURE LIMITS**
Material Revised IDLH Value (mg/m³) Revised IDLH Value (ppm)
Portland cement:13763 5,000

**MATERIAL DATA**
DENTSPLY PROROOT MTA ROOT CANAL REPAIR MATERIAL: PORTLAND CEMENT
- The concentration of dust, for application of respirable dust limits, is to be determined from the fraction that penetrates a separator whose size collection efficiency is described by a cumulative log-normal function with a median aerodynamic diameter of 4.0 µm (~) 0.3 µm and with a geometric standard deviation
Gloves should be examined for wear and/or degradation constantly.

- polyvinyl chloride
- fluorocautchouc
- butyl rubber
- nitrile rubber
- polychloroprene

Recommended.

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.

- Contaminated gloves should be replaced.

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.

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.

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

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

- dexterity
- glove thickness and chemical resistance of glove material,
- 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.

Contaminated gloves should be replaced.

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.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/or degradation constantly.

PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- 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].

HANDS/FEET

GENERAL

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odor, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOLE); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:
- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

GYPSUM:

- For calcium oxide:

The TLV/TWA's thought to be protective against undue irritation and is analogous to that recommended for sodium hydroxide.

Portland cement is considered to be a nuisance dust that does not cause fibrosis and has little potential to induce adverse effects on the lung.

BISMUTH(III) OXIDE:

It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practical and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odor, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOLE); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:
- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

PORTLAND CEMENT:

DENTSPLY PROROOT MTA ROOT CANAL REPAIR MATERIAL:

The TLV-TWA is thought to be protective against undue irritation and is analogous to that recommended for sodium hydroxide.

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].

HANDS/FEET

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odor, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOLE); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:
- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

GYPSUM:

- For calcium carbonate:

The TLV/TWA's thought to be protective against the significant risk of physical irritation associated with exposure. for calcium sulfate:

The TLV/TWA's thought to be protective against the significant risks of eye, skin and other physical irritation.

Because the margin of safety of the quartz TLV is not known with certainty and given the associated link between silicosis and lung cancer it is recommended that quartz concentrations be maintained as far below the TLV as prudent practices will allow.

PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- 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].

HANDS/FEET

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.

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 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.

Contaminated gloves should be replaced.

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.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/or degradation constantly.
OTHER
- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

RESPIRATOR
- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.
- The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMATCH data (if available), or your Occupational Health and Safety Advisor.

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.

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, conveyor 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:

1: Room air currents minimal or favourable to capture
2: Contaminants of low toxicity or of nuisance value only
3: Intermittent, low production.
4: Large hood or large air mass in motion

Upper lower end of the range
1: Disturbing room air currents
2: Contaminants of high toxicity
3: High production, heavy use
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 extraction point and 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.

### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE**
Grey powder; does not mix with water.

**PHYSICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Divided Solid</td>
<td>Molecular Weight</td>
</tr>
<tr>
<td>Melting Range (°C)</td>
<td>Not Available</td>
<td>Viscosity</td>
</tr>
<tr>
<td>Boiling Range (°C)</td>
<td>Not Available</td>
<td>Solubility in water (g/L)</td>
</tr>
<tr>
<td>Flash Point (°C)</td>
<td>Not Available</td>
<td>pH (1% solution)</td>
</tr>
<tr>
<td>Decomposition Temp (°C)</td>
<td>Not Available</td>
<td>pH (as supplied)</td>
</tr>
<tr>
<td>Autoignition Temp (°C)</td>
<td>Not Available</td>
<td>Vapour Pressure (kPa)</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Available</td>
<td>Specific Gravity (water=1)</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Available</td>
<td>Relative Vapour Density (air=1)</td>
</tr>
<tr>
<td>Volatile Component (%)</td>
<td>Not Available</td>
<td>Evaporation Rate</td>
</tr>
</tbody>
</table>

### Section 10 - CHEMICAL STABILITY

**CONDITIONS CONTRIBUTING TO INSTABILITY**
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

### Section 11 - TOXICOLOGICAL INFORMATION

**POTENTIAL HEALTH EFFECTS**
Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual. Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons (1/50,000 inch), are present. Lung shadows are seen in the X-ray. Symptoms of pneumoconiosis may include a progressive dry cough, shortness of breath on exertion, emphysema and pneumothorax (air in lung cavity) as a rare complication.

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.

On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects in the course of the animal's life. Inadequate data for reliable weighting of these effects, however, has been provided. Light scattering from asbestos fibers results in a more rapid and higher degree of lung fibrosis.

Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds 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.

Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual. Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, and those with impaired lung capacity, chest infections, chest deformities and/or cardiovascular disease may incur further disability if excessive concentrations of particulate are inhaled.

Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons. Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons. Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons. Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons. Levels above 10 µg/m³ of suspended inorganic sulfates in the air may cause an excess risk of asthma attacks in susceptible persons.
Dust inhalation over an extended number of years may produce pneumoconiosis. Pneumoconiosis is the accumulation of dusts in the lungs and the tissue reaction in its presence. It is further classified as being of noncollagenous or collagenous types. Noncollagenous pneumoconiosis, the benign form, is identified by terminal stromal reaction, consists mainly of reticulin fibres, an intact alveolar architecture and is potentially reversible. Symptoms of chronic bismuth toxicity in humans consist of decreased appetite, weakness, rheumatic pain, diarrhoea, fever, dull breath, gingivitis and dental caries. The true line of the gums, the “bismuth limits”, may persist for years after exposure has ceased. Lanark and conjunctival haemorrhage are rare, but have been reported. Bismuth neuropathy (kidney damage), with proteinuria may occur. The kidney is the site of highest concentration with liver concentrations being significantly lower. Renal failure may be reversible if treated early but anuria and death have occurred.

TOXICITY AND IRRITATION

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances

Asthma-like symptoms may continue for many years following exposure to the following dusts.

Anaplastic carcinoma was found in the heart, and one dark cell carcinoma was seen in the kidney. Two tumours of unspecified type, one of which was a sarcoma, were seen in the lungs of guinea pigs exposed to calcined calcium sulfate (1.6 x 10^4 particles/mL) for 44 hours per week in 5.5 days for two years, followed with or without a recovery period of up to 60 days. Inflammation (specifically, chronic alveolitis with macrophage and neutrophil aggregation) was observed in the lung.

Inhalation (nose-only) experiments in which male F344 rats were exposed to calcium sulfate fiber aerosols (100 mg/m^3) for six hours per day, five days per week for three weeks, there were no effects on the number of macrophages per alveolus, bronchoalveolar lavage fluid (BALF) protein concentration, or BALF g-glutamyl transpeptidase activity (g-GT). Following three weeks of recovery, nonprotein thiol levels (NPSH), mainly glutathione, were increased in animals. In follow-up experiments, rats were exposed to an aerosol of anhydrous calcium sulfate fibers (15 mg/m^3) or a combination of milled and fibrous calcium sulfate dust with or without a recovery period of up to 60 days. Calcium levels in the lungs were similar to those of controls; however, gypsum fibers were detected in the lungs of treated animals. Significant increases in NPSH levels in BALF were observed in rats killed immediately after exposure at both doses and in recovery group animals at the higher dose. At 15 mg/m^3, almost all NPSH was lost in macrophages from all treated animals (including those in recovery), but a significant decrease in extracellular g-GT activity was seen only in recovery group animals. Overall, the findings were considered to be non-pathological local effects due to physical factors related to the physicochemical shape of the dust particle and not to calcium sulfate per se.

Intratracheal administration of man-made calcium sulfate fiber (2.0 mg) once per week for five days produced tumours in three of 20 female Syrian hamsters compared to controls.

In guinea pigs, inhalation of calcined gypsum dust (1.6 x 10^4 particles/mL) for 44 hours per week in 5.5 days for three months, pigmentation and atelectasis were seen. During the recovery period, four of ten guinea pigs died; two died of pneumonia.

Inflammation (specifically, chronic alveolitis with macrophage and neutrophil aggregation) was observed in the lung.

In inhalation (nose-only) experiments in which male F344 rats were exposed to a combination of milled and fibrous calcium sulfate dust (60 mg/m^3) for the same duration. Calcium levels in the lungs were similar to those of controls; however, gypsum fibers were detected in the lungs of treated animals.

Asthma-like symptoms may continue for many years following exposure to the following dusts.

Inhalation (nose-only) experiments in which male F344 rats were exposed to an aerosol of anhydrous calcium sulfate fibers (100 mg/m^3) for six hours per day, five days per week for three weeks, there were no effects on the number of macrophages per alveolus, bronchoalveolar lavage fluid (BALF) protein concentration, or BALF g-glutamyl transpeptidase activity (g-GT). Following three weeks of recovery, nonprotein thiol levels (NPSH), mainly glutathione, were increased in animals. In follow-up experiments, rats were exposed to an aerosol of anhydrous calcium sulfate fibers (15 mg/m^3) or a combination of milled and fibrous calcium sulfate dust with or without a recovery period of up to 60 days. Calcium levels in the lungs were similar to those of controls; however, gypsum fibers were detected in the lungs of treated animals. Significant increases in NPSH levels in BALF were observed in rats killed immediately after exposure at both doses and in recovery group animals at the higher dose. At 15 mg/m^3, almost all NPSH was lost in macrophages from all treated animals (including those in recovery), but a significant decrease in extracellular g-GT activity was seen only in recovery group animals. Overall, the findings were considered to be non-pathological local effects due to physical factors related to the physicochemical shape of the dust particle and not to calcium sulfate per se.

Intratracheal administration of man-made calcium sulfate fiber (2.0 mg) once per week for five days produced tumours in three of 20 female Syrian hamsters compared to controls.

In guinea pigs, inhalation of calcined gypsum dust (1.6 x 10^4 particles/mL) for 44 hours per week in 5.5 days for three months, pigmentation and atelectasis were seen. During the recovery period, four of ten guinea pigs died; two died of pneumonia.

Inflammation (specifically, chronic alveolitis with macrophage and neutrophil aggregation) was observed in the lung.

In inhalation (nose-only) experiments in which male F344 rats were exposed to a combination of milled and fibrous calcium sulfate dust (60 mg/m^3) for the same duration. Calcium levels in the lungs were similar to those of controls; however, gypsum fibers were detected in the lungs of treated animals. Significant increases in NPSH levels in BALF were observed in rats killed immediately after exposure at both doses and in recovery group animals at the higher dose. At 15 mg/m^3, almost all NPSH was lost in macrophages from all treated animals (including those in recovery), but a significant decrease in extracellular g-GT activity was seen only in recovery group animals. Overall, the findings were considered to be non-pathological local effects due to physical factors related to the physicochemical shape of the dust particle and not to calcium sulfate per se.

Intratracheal administration of man-made calcium sulfate fiber (2.0 mg) once per week for five days produced tumours in three of 20 female Syrian hamsters compared to controls.

In guinea pigs, inhalation of calcined gypsum dust (1.6 x 10^4 particles/mL) for 44 hours per week in 5.5 days for three months, pigmentation and atelectasis were seen. During the recovery period, four of ten guinea pigs died; two died of pneumonia.

Inflammation (specifically, chronic alveolitis with macrophage and neutrophil aggregation) was observed in the lung.

In inhalation (nose-only) experiments in which male F344 rats were exposed to a combination of milled and fibrous calcium sulfate dust (60 mg/m^3) for the same duration. Calcium levels in the lungs were similar to those of controls; however, gypsum fibers were detected in the lungs of treated animals. Significant increases in NPSH levels in BALF were observed in rats killed immediately after exposure at both doses and in recovery group animals at the higher dose. At 15 mg/m^3, almost all NPSH was lost in macrophages from all treated animals (including those in recovery), but a significant decrease in extracellular g-GT activity was seen only in recovery group animals. Overall, the findings were considered to be non-pathological local effects due to physical factors related to the physicochemical shape of the dust particle and not to calcium sulfate per se.

Intratracheal administration of man-made calcium sulfate fiber (2.0 mg) once per week for five days produced tumours in three of 20 female Syrian hamsters compared to controls.
types were observed in the rib.

In guinea pigs, inhalation of gypsum (doses not provided) for 24 months produced no lung tumours.

In rats, i.t. administration of gypsum (doses not provided in abstract) from FGD for up to 18 months produced no arterial blood gas changes or indications of secondary heart damage as compared to controls.

In another study, a single i.t. dose (25 mg) of fly ash gypsum dust did not produce a pathological reaction when observed for up to 18 months. There were also no signs of developing granuloma of the ribs. Lead quickly accumulated in the femur after injection but was eliminated during the observation period. In the Ames test, the fly ash gypsum dust was negative.

Genotoxicity: Calcium sulfate (up to 2.5%) was negative in Salmonella typhimurium strains TA1535, TA1537, and TA1538 and in Saccharomyces cerevisiae strain D4 with and without metabolic activation.

Developmental toxicity: In pregnant mice, rats, and rabbits, daily oral administration of calcium sulfate (16-1600 mg/kg bw) beginning on gestation day 6 up to 18 produced no effects on maternal body weights, maternal or foetal survival, or nidation; developmental effects were also not seen.

### Section 12 - ECOLOGICAL INFORMATION

**BISMUTH(III) OXIDE**

**Gypsum**

**PORTLAND CEMENT**

**Do not discharge into sewer or waterways.**

**BISMUTH(III) OXIDE**

**PORTLAND CEMENT**

Metal-containing organic substances generally have negligible vapour pressure and are not expected to partition to air. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. Environmental processes (such as oxidation and the presence of acids or bases) may transform insoluble metals to more soluble ionic forms. Microbiological processes may also transform insoluble metals to more soluble forms. Such ionic species may be toxic to dissolved ligands or sorb to solid particles in aquatic or aqueous media. As significant proportion of dissolved/sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal may then be taken up by aquatic organisms.

When released to dry soil most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/or surface water ecosystems when soaked by rain or melt ice. Environmental processes may also be important in changing solubilities. Even though many metals show few toxic effects at physiological pHs, transformation may introduce new or magnified effects.

A metal ion is considered irreversible once it cannot be taken up by aquatic organisms.

The current state of science does not allow for an unambiguous interpretation of various measures of bioaccumulation.

The counter-ion may also create health and environmental concerns once isolated from the metal. Under normal physiological conditions the counter-ion may be essentially insoluble and may not be bioavailable.

Environmental restrictions may enhance bioavailability.

**PORTLAND CEMENT**

**BISMUTH(III) OXIDE**

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.

Toxic to aquatic organisms.

Do not allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

Waters resulting from use of the product must be disposed of on site or at approved waste sites.

Bismuth is often marketed as an environmentally friendly alternative to the traditional, more toxic heavy metals. Under the present level of exposure and emission to the environment, no adverse effects of bismuth have been observed on humans and animals. According to a Swedish study, no biological functions of bismuth are known.

Bismuth occurs in fresh and sea water as hydroxides (Bi(OH)2+ and Bi(OH)30). In the aquatic environment bismuth is associated with particulate matter with a high retention time in the aquatic environment. Bismuth can be methylated in the environment. In this form, bismuth has high lipophilicity and it can bioaccumulate in lipid-rich environments.

If plants take up the metal, it can be partly or completely deactivated by complexation with phytochelation. Deactivation of enzymes, which are affected by metals, is thereby avoided. The fact that this mechanism of defence is active with bismuth (and other metals, e.g. Cd2+ and Pb2+) indicates that the metal can affect biological functions. The metal has high affinity to particles (comparable with lead's metal affinity).

Over the years, discussion regarding the environmental toxicity of bismuth and its compounds has been available. Bismuth nitrate has high acute toxicity in the aquatic environment and EC50 has been determined to 0.66 mg/L in a four day test using Tubifex tubifex as test organism. According to this result, the compound should be classified as very toxic to aquatic organisms. The available data on environmental fate of bismuth is not sufficient to conclude on its bioaccumulation potential. In the marine environment, bismuth is typically associated with particulate matter.

Due to the potential for bioaccumulation bismuth might cause adverse environmental and health effects.

**Gypsum**

for inorganic sulfates

Environmental fate

Data from tap water studies with human volunteers indicate that sulfates produce a laxative effect at concentrations of 1000 - 1200 mg/litre, but no increase in diarrhoea, dehydration or weight loss. The presence of sulfate in drinking-water can also result in a noticeable taste; the lowest taste threshold concentration for sulfate is approximately 250 mg/litre as the sodium salt. Sulfate may also contribute to the corrosion of distribution systems. No health-based guideline value for sulfate in drinking water is proposed. However, there is an increasing likelihood of complaints arising from a noticeable taste as concentrations in water increase above 500 mg/litre.

Sulfates are removed from the air by both dry and wet deposition processes. Wet deposition processes including rain-out (a process that occurs within the clouds) and washout (removal by precipitation below the clouds) contribute to the removal of sulfate from the atmosphere.

In soil, the inorganic sulfates can adsorb to soil particles or leach into surface water and groundwater. Sulfates can be taken up by plants and be incorporated into the parenchyma of the plant. Sulfate in rainwater can also be reduced by sulfate bacteria (Thiobacillus) which use them as a source of energy.

In anaerobic environments, sulfate is biologically reduced to (hydrogen) sulfide by sulfate reducing bacteria, or incorporated into living organisms as source of sulfur, and thereby included in the sulfur cycle. Sodium sulfate is not reactive in aqueous solution at room temperature. Sodium sulfate will completely dissolve, ionise and distribute across the entire planetary "aquasphere". Some sulfates may eventually be deposited, the majority of sulfates participate in the sulfur cycle in which natural and industrial sodium sulfates are not distinguishable.

The BCDF of sodium sulfate is very low and therefore significant bioconcentration is not expected. Sodium and sulfate ions are essential to all living organisms and their intracellular and extracellular concentrations are actively regulated. However some plants (e.g. com and Kochia scoparia) are capable of accumulating sulfates to concentrations that are potentially toxic to ruminants.

**Ecotoxicity**

For sulfate in general

**Fish LC50 toxic from 7000 mg/l**

**Bacteria toxic from 2500 mg/l**

Algae were shown to be the most sensitive to sodium sulfate; EC50 120 h = 1,900 mg/l. For invertebrates (Daphnia magna) the EC50 48 h = 4,580 mg/l and fish appeared to be the least sensitive with a LC50 96h = 7,980 mg/l for Pimephales promelas. Activated sludge showed a very low sensitivity to sodium sulfate. There was no effect up to 8 g/l. Sodium sulfate is not toxic to terrestrial plants. Popca banksiana was the most sensitive species, an effect was seen at 1.4 g/l.

Sodium sulfate was not very sensitive or the sediment dwelling organisms. Toxicity to terrestrial plants is also low.

No data were found for long term toxicity. The acute studies all show a toxicity of sodium sulfate higher than 100 mg/l, no bioaccumulation is expected.

**Ecotoxicity**

**Persistence:**

Water/Soil: No Data Available

Air: No Data Available

**Bioaccumulation:**

No Data Available

**Mobility:**

No Data Available

**Ingredient:**

**DENTSPLY PROROOT MTA ROOT CANAL REPAIR**

<table>
<thead>
<tr>
<th>Water/Soil</th>
<th>Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Data Available</td>
<td>No Data Available</td>
<td>No Data Available</td>
<td>No Data Available</td>
</tr>
</tbody>
</table>
Section 13 - DISPOSAL CONSIDERATIONS

Title Legisaltion 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. Shelf life considerations should also be made in deciding whether to dispose 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 Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:
None (ADG7)
NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE
None

REGULATIONS
Regulations for ingredients
portland cement (CAS: 65997-15-1) is found on the following regulatory lists;
"Australia Exposure Standards","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)"
bismuth(III) oxide (CAS: 1304-78-3) is found on the following regulatory lists;
"Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)"
gypsum (CAS: 13397-24-5) is found on the following regulatory lists;
"Australia Exposure Standards","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines","International Council of Chemical Associations (ICCA) - High Production Volume List"
No data for DENTSPLY PROROOT MTA ROOT CANAL REPAIR MATERIAL (CW: 4620-52)

Section 16 - OTHER INFORMATION

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

The (M)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.

This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.

www.chemwatch.net

Issue Date: 24-Aug-2011
Print Date: 30-Sep-2011