SAFETY DATA SHEET

PRODUCT NAME: Borax Pentahydrate

July 2013

IDENTIFICATION

Product Name: Borax
Other Names: Borax Pentahydrate, Sodium Tetraborate Pentahydrate
Product Code: CB25
Uses: The product is used in industrial manufacturing, in particular ceramics, detergent, borosilicate glass and insulation fiberglass.

Supplier: HamChem Hamilton Chemicals Ltd, 355 Kahikatea Drive, Hamilton
Phone: 078475840, Fax 078475882, info@hamchem.co.nz

- **In emergency dial 111, and then ask for Fire, Ambulance or Police as necessary.**
- **In case of poisoning phone National Poisons Centre – 0800 764 766**

HAZARD IDENTIFICATION

DANGER
Keep out of reach of children
Read label and SDS thoroughly before use.
HSNO Classifications: 6.1E, 6.4A, 6.8B, 9.1D

Prevention: Keep out of reach of children. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Avoid release into the environment.

Response: If medical advice is needed, have product container or label at hand. Call a POISON CENTRE or Doctor if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so, continue rinsing. If eye irritation persists: Get medical attention. If exposed or concerned: Get medical attention.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with relevant legislation.
Hazardous Substances (Disposal) Regulations 2001

- D2 (R6), D4 (R8), D5 (R9), D6 (R10), D7 (R11, 12), D8 (13, 14)

COMPOSITION & INFORMATION ON INGREDIENTS

Chemical Entity	CAS No.	Proportion (%)
Borax Pentahydrate	12179-04-3	>48%

PRODUCT NAME:	Borax Pentahydrate

FIRST AID MEASURES

Swallowed: IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. For advice, contact a Poison Centre or a doctor. In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.

Eye: If this product comes in contact with the eyes: Immediately hold eyelids apart and flush the eye continuously with running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. Continue flushing until advised to stop by the Poison Centre or a doctor, or for at least 15 minutes. Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin: If skin or hair contact occurs: Flush skin and hair with running water (and soap if available). Seek medical attention in event of irritation.

Inhaled: If fumes or combustion are inhaled remove from contaminated area. Lay patient down. Keep warm and rested. Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. Transport to hospital, or doctor.

Notes to Physician: For acute or repeated short term exposures to boron and its compounds: Nausea, vomiting, diarrhoea, and epigastric pain, haematemesis and blue-green discolouration of both faeces and vomitus characterize adult boron intoxication. Access and correct any abnormalities found in airway and circulation. A tidal volume of 10-15 mg/kg should be maintained. Emesis should be induced unless the patient is in a coma, is experiencing seizures or has lost the gag reflex. If any of these are present, gastric lavage should be performed with a large-bore tube after endotracheal intubation or in the presence of continuous respiratory action. Activated charcoal is probably not of value though its use might be indicated following gastric evacuation. Catharsis might be useful to eliminate any borates remaining in the gastro-intestinal tract (magnesium sulphate: adults, 30 gms: children 240 mg/kg). Peritoneal dialysis and haemodialysis remove some borates.

http://www.toxinz.com/

SYMPTOMS AND EFFECTS, ACUTE AND DELAYED, FROM EXPOSURE

Aggravated medical conditions caused by exposure: Signs and symptoms of exposure: Symptoms of accidental over-exposure to borax Pentahydrate have been associated with ingestion or absorption through large areas of damage skin. These may include nausea, vomiting, and diarrhoea, with delayed effects of skin redness and peeling.

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Target Organs: No target organ has been identified in humans. High-dose animal ingestion studies indicate the testes are the target organs in male dogs.
Developmental Effects: Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction.
Carcinogenicity: No evidence of carcinogenicity in mice. No mutagenic activity was observed for boric acid, a chemically related substance, in a battery of short-term mutagenic assays.
Human Data: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

FIRE FIGHTING MEASURES

Extinguishing media: There is no restriction on the type of extinguisher which may be used.

Fire fighting: Alert Fire Brigade and tell them location and nature of hazard. Wear breathing apparatus plus protective gloves. Prevent, by any means available, spillage from entering drains or water courses. Cool fire exposed containers with water spray from a protected location. If say to do so, remove containers from path of fire.

Fire/explosion hazard: Non-combustible. Not considered a significant fire risk, however containers may burn. Decomposition may produce toxic fumes of: caustic compounds.

Fire incompatibility: None known.

Personal Protective Equipment: Breathing apparatus.

ACCIDENTAL RELEASE MEASURES

Minor spills: Clean up all spills immediately. Wear impervious gloves and safety glasses. Avoid contact with skin and eyes. Use dry clean up procedures and avoid generating dust. Place in suitable containers for disposal. Flush residue away with large quantities of water.

Major spills: Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard. Control personal contact by using protective equipment and dust respirator. Prevent spillage from entering drains, sewers or water courses. Recover product wherever possible. Avoid generating dust. Sweep/shovel up. If required, wet with water to prevent dusting. Put residues in labelled plastic bags or other containers for disposal. Wash area down with large quantity of water and prevent runoff into drains. If contamination of drains or waterways occurs, advise emergency services.

Emergency Response Planning Guidelines (ERPG):

- The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing life-threatening health effects is:

Borax Pentahydrate: 25mg/m^3

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- Irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

Borax Pentahydrate: 5mg/m^3

- Other than mild, transient adverse effects without perceiving a clearly defined odour is:

Borax Pentahydrate: 3mg/^{3}

- The threshold concentration below which most people experience no appreciable risk of health effects:

Borax Pentahydrate: 3mg/m^3

HANDLING & 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. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

Suitable container: Glass container, plastic drum, polyethylene or polypropylene container, metal drum. Check that containers are clearly labelled.

Storage incompatibility: Segregate from acids.

Storage requirements: Store in original containers. Keep containers securely sealed. Store in a cool, dry, well-ventilated area. Store away from incompatible materials and foodstuff containers. Protect containers against physical damage and check regularly for leaks. Observe manufacturer's storing and handling recommendations.

EXPOSURE CONTROLS & PERSONAL PROTECTION

Exposure standards: TWA = 1mg/m^3

Engineering controls: Use local exhaust ventilation to keep airborne concentrations of borax dust below permissible exposure levels.

PERSONAL PROTECTION EQUIPMENT (PPE)

Airborne exposure limits: None established.

Ventilation system: A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general

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work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal respirators (NIOSH approved): For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmosphere.

Skin protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate to prevent skin contact.

Eye protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

PHYSICAL & CHEMICAL PROPERTIES

Appearance: White crystalline solid.
Odour: Odourless.
Specific Gravity: 1.81
Solubility: 3.7g/L @ 25ºC
Flash point: N/A
Flammability limits: N/A
Boiling point: 1575ºC
Melting point: 200ºC
pH: 9.3 (3% solution)
Molecular weight: 291.35

STABILITY & REACTIVITY

Stability: Product is stable under normal conditions of use and storage.

Hazardous decomposition products: When involved in a fire, this product may generate irritating and toxic gases and fumes.

Incompatibles: Incompatible with oxidising agents, strong reducing agents such as metal hydrides, acetic anhydride, alkali metals, and sources of ignition.

Conditions to avoid: Avoid excessive heat, direct sunlight, static discharges, generating dust, moisture and high temperatures.

TOXICOLOGICAL INFORMATION

TOXICITY:

Toxicity data:
Oral LD50 Rat: 3200-3500mg/Kg

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Oral LD50 Rat: 4500-5000mg/Kg
Dermal LD50 Rabbit: >10000mg/Kg
Inhalation LC50 Rat: >2.0mg/L
Skin Irritant: Non-irritant
Eye Irritation: Mild irritation in rabbits.
Sensitisation: Not a skin sensitiser.
Reproductive/Developmental: Feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes. Studies with the chemically related boric acid in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the foetus, including weight loss and minor skeletal variations. The doses administered were many times in excess of those to which humans would normally be exposed to.

Skin: Low acute dermal toxicity; LD50 in rabbits is greater than 2,000 mg/kg of body weight. Borax pentahydrate is poorly absorbed through intact skin.

Inhalation: Low acute inhalation toxicity; LC_{50} in rats is greater than 2.0 mg/l (org/m^3).

Reproductive/developmental toxicity: Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes. Studies with the chemically related boric acid in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the foetus including foetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to.

Carcinogenicity/mutagenicity: Not a carcinogen. Not a mutagen.

Human data: Human epidemiology studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

Skin irritation: Non-irritant.

Eye irritation: Mild eye irritation in rabbits. Fifty years of occupational exposure to borax pentahydrate indicate no adverse effects on human eye. Borax pentahydrate is a constituent of eye lotions.

Sensitisation: Borax pentahydrate is not a skin sensitizer.

POTENTIAL ACUTE HEALTH EFFECTS
ACUTE HEALTH EFFECTS

Swallowed: The material is moderately discomforting to the gastro-intestinal tract. Individuals vary greatly in their susceptibility to poisoning and symptoms may appear after a few weeks or many years of exposure. Considered an unlikely route of entry in commercial/industrial environments.

Eye: The dust may produce eye discomfort causing smarting, pain and redness.

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Skin: The material is moderately discomforting to the skin and is capable of causing skin reactions which may lead to dermatitis. WARNING! Open cuts, abraded or irritated skin should not be exposed to this material.

Inhaled: The dust may be discomforting to the upper respiratory tract. Inhalation of small amounts of dust or fume over long periods may cause poisoning. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

Chronic health hazards: Principal routes of exposure are usually by inhalation of generated dust and inhalation of fumes from the heated material.

ECOLOGICAL INFORMATION

Ecotoxicity: 9.1D Classification based on biocidal action.

General: Boron occurs naturally in sea water at an average concentration of 5 mg B/l and fresh water at 1 mg B/l or less. In dilute aqueous solutions the predominant boron species present is un-dissociated boric acid.

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimise the amount of borate product released to then environment.

Algal toxicity:
Green algae, *Scenedesmus subspicatus*
96-hr IC_{10} = 24mg B/1

Invertebrate toxicity:
Daphnia, *Daphnia magna* Straus
24-hr IC_{50} = 242mg B/1

Fish toxicity:
Sea water: Dab, Limandalimanda
96-hr LC_{50} = 74mg B/l
Freshwater: Rainbow trout, *Oncorhynchus mykiss* (embryo-larval stage)
24-day LC_{50} = 88mg B/l
32-day LC_{50} = 54mg B/l
Goldfish, *Carassius auratus* (embryo-larval stage)
7-day LC_{50} = 65mg B/l
3-day LC_{50} = 71mg B/l
Test substance: Sodium tetraborate

ENVIRONMENTAL FATE DATA

Persistence/Degradation: Boron is naturally occurring and ubiquitous in the environment. Borax pentahydrate decomposes in the environment to natural borate.

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Octanol/Water partition coefficient: No value. In aqueous solution borax pentahydrate is converted substantially into un-dissociated boric acid.

Soil mobility: The product is soluble in water and is leachable through normal soil.

DISPOSAL CONSIDERATIONS

Recycle wherever possible. Bury residue in an authorised landfill. Recycle containers if possible, or dispose of in an authorised landfill. Containers may still present a chemical hazard/danger when empty. Otherwise: If container cannot be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. Contact appropriate Waste Management company for guidance and disposal options in your area. Where possible retain label warnings and SDS and observe all notices pertaining to the product.

TRANSPORT INFORMATION

UN Number: N/A
Proper Shipping name: Sodium Tetraborate Pentahydrate
Dangerous Goods Class: N/A
Subsidiary Risk: N/A
Packing group: N/A
Hazchem Code: N/A

REGULATORY INFORMATION

HSNO Classifications: 6.1E, 6.4A, 6.8B, 9.1D

OTHER INFORMATION

Key to abbreviations:

End of SDS.

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