

SAFETY DATA SHEET

PRODUCT NAME: BORIC ACID

Issue Date: May 23

IDENTIFICATION

Product Name: Boric Acid
Other Names: Boracic Acid; BORIC ACID (H₃BO₃); Borofax; Orthoboric Acid
Product Code: CBA25, CBA1
Uses: Laboratory chemicals, manufacture of substances
Supplier: HamChem Hamilton Chemicals Ltd, 75 Ruffell Rd, Hamilton
Phone: 079744971 Web: www.hamchem.nz Email: info@hamchem.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



GHS Classifications

Eye Irritation – Category 2
Reproductive Toxicity – Category 2
Designed for Biocidal Action

Signal Word: Warning

Hazard Statements

H319 – Causes serious eye irritation
H361 – Suspected of damaging fertility or the unborn child

Prevention

P264 - Wash hands and exposed skin thoroughly after handling
P280 – Wear protective gloves/clothing and eye/face protection
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood

Response

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes, remove contact lenses if present and easy to do so, continue rinsing
P337+P313 – If eye irritation persists: Get medical advice/attention
P308+P313 – If exposed or concerned: Get medical advice/attention

Storage

P405 - Store locked up

Disposal

P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

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COMPOSITION & INFORMATION ON INGREDIENTS

Chemical Entity	CAS No.	Proportion (%)
Boric Acid	10043-35-3	> 99.9%

FIRST AID MEASURES

Main Symptoms caused by Exposure: Harmful if swallowed, leading to nausea, vomiting, stomach ache and diarrhoea. Irritating to skin (redness/rash) and eyes (pain, redness). May cause respiratory tract irritation (dry mouth, nose and throat, coughing and nose bleeds). Suspected of causing reproductive and developmental defects if high doses are ingested, and abnormal postures, convulsions and coma in infants.

Swallowed: If patient is conscious, induce vomiting. Rinse mouth, then give 1-2 glasses of milk or water to drink. Seek medical attention.

Eye: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Seek medical attention if irritation persists.

Skin: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before re-use.

Inhaled: Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen if possible. Call a Doctor/Physician.

Advice to Doctor: Treat symptomatically based on judgment of Doctor and individual reactions of patient.

FIRE FIGHTING MEASURES

Extinguishing Media: Use any means suitable for extinguishing surrounding fire; water spray, dry chemical, foam or carbon dioxide.

Fire Fighting: Alert Fire Brigade and tell them location and nature of hazard. Clear fire area of all unnecessary personnel. Stay upwind. Eliminate ignition sources. Wear breathing apparatus plus protective gloves. Prevent spillage from entering drains or water courses. Use firefighting procedures suitable for 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/Explosion Hazard: Non combustible Boric acid is flame retardant. Not considered to be a significant fire risk, however containers may burn. In a fire may decompose on heating and product toxic/corrosive fumes.

Personal Protective Equipment: Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves).

ACCIDENTAL RELEASE MEASURES

General Response Procedure: Avoid accidents, clean up immediately. Slippery when spilt. Eliminate all sources of ignition. Increase ventilation. Avoid generating dust. Stop leak if safe to do so. Isolate danger area. Use clean non-sparking tools and equipment.

Clean-Up Procedure: Land Spill – Vacuum, shovel or sweep up boric acid and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during clean up and disposal. Spillage into Water – Where possible, remove any intact containers from the water. Advise

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local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level,

Containment: Stop leak if safe to do so. Isolate danger area.

Environmental Precautionary Measures: Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. Boric Acid is water soluble. At high concentrations it may cause damage to trees or vegetation by root absorption.

Evacuation Criteria: Evacuate all unnecessary personnel.

HANDLING & STORAGE

Handling: Protect against physical damage. Wash hands after handling this material. Avoid contact especially when skin is cut or abraded. Good housekeeping and dust prevention procedures should be followed to minimize dust generation and accumulation. Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Avoid contact with eyes, skin and clothing. Do not inhale product dust/fumes. Your supplier can advise you on safe handling, please contact the supplier. The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances. No special handling precautions are required.

Storage: Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in this SDS. To maintain package integrity and to minimize caking of the product, bags should be handled on a first in, first out basis. Store under cold to warm conditions, 2 to 40 deg C. Use good housekeeping practices to prevent accumulation of dust and follow sound cleaning techniques that will keep airborne particulates at a low level. Dry indoor storage is recommended. Provide appropriate ventilation and store bags such as to prevent any accidental damage.

Container: Carbon steel or aluminum containers are suitable for storage. Stainless steel is needed for moist conditions. Containers of the materials may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

EXPOSURE CONTROLS & PERSONAL PROTECTION

General: No exposure standard has been established for this product by WorkSafe NZ or the Australian Safety and Compensation Council. However, the exposure standard for dust not otherwise specified is 10mg/m³ (for inspirable dust) and 3mg/m³ (for respirable dust).

Exposure Limits: No data available.

Biological Limits: No information available on biological limit values for this product.

Engineering Measures: 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 a contaminant at its source, preventing dispersion of it into the general work area.

Personal Protection Equipment: RESPIRATOR: An approved dust mask e.g. a P1 respirator, is recommended when using this product in dusty conditions. For more information see Australian/New Zealand Standard, AS/NZS 1715:2009 and AS/NZS 1716:2012. If in doubt, seek expert occupational hygiene advice. SKIN: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Refer to AS/NZS 2161.1:2000 Occupational Protective Gloves – Selection, use and maintenance. Dispose of contaminated gloves after use. EYES: Use approved chemical safety goggles and a full-face shield where splashing is possible. Refer to Personal eye protection

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Part 1: Eye and face protectors for occupational applications, Australian/New Zealand Standard: AS/NZS 1337.1:2010. Maintain eye wash fountain in work area. OTHER: Ensure there is ready access to an emergency shower. Ensure that there is ready access to eye wash unit.

PHYSICAL & CHEMICAL PROPERTIES

Physical state:	Crystalline Solid
Colour:	White
Odour:	Odourless
Molecular Formula:	H3BO3
Molecular Weight:	61.84
Melting Range (°C):	>1000
Boiling Range (°C):	Not available
Solubility in water (g/L):	48.24 @ 20°C
pH:	3.7 (saturated solution)
Specific Gravity:	1.44-1.52
Relative Density:	1.49 (23°C)
Vapour Pressure (20 °C):	9.9×10^{-5}
Flash Point (°C):	Not applicable
Flammability Limits (%):	Not available
Autoignition Temperature (°C):	Not available
Decomposition Temperature (°C):	171
Physical Properties:	Mixes with water, glycerol, ether, alcohol, methanol, liquid ammonia; slightly soluble in Acetone

STABILITY & REACTIVITY

General Information: Reactivity: Loses chemically combined water upon heating, forming metaboric acid (HBO₂) at 99-104 deg C, then pyroboric acid (H₂B₄O₇) at 139-158 deg C, and boric anhydride at higher temperatures. Boric acid reacts as a weak acid which may cause corrosion of base metals. Reactions with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosion hazard.

Chemical Stability: Stable under ordinary conditions of use and storage. If moisture is present, boric acid can be corrosive to iron. Boric acid is a stable product, but when heated it loses water, first forming metaboric acid (HBO₂), and on further heating it is converted into boric oxide (B₂O₃).

Conditions to Avoid: Avoid excessive heat, humidity, direct sunlight, static discharges, moisture and temperature extremes. Keep containers dry and tightly closed to avoid moisture absorption and contamination.

Incompatible Materials: Strong reducing agents (metal anhydrides or alkali metals), Potassium, acetic anhydride, alkalis, carbonates and hydroxides.

Hazardous Decomposition Products: Thermal decomposition can lead to release of carbon oxides.

Hazardous Polymerisation: Will not occur.

TOXICOLOGICAL INFORMATION

Toxicity data: Acute Oral Toxicity, Mouse, LD₅₀: 2668 mg/kg; Acute Dermal Toxicity, Rabbit, LD₅₀: >2000 mg/kg (not absorbed by intact skin); Acute Inhalation Toxicity, Rat, 4hr LC₅₀: >2.03 mg/kg

Irritation data: Skin: Irritating to skin in dry form. Eyes: Slightly irritating to eyes.

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ACUTE HEALTH EFFECTS

Swallowed: The substance is harmful if swallowed. Swallowing of a large quantity may cause abdominal pains and cyanosis. Borate poisoning causes nausea, vomiting, diarrhoea and pain in the upper abdomen. Often persistent vomiting occurs, and there may be blood in the faeces. There may also be weakness, lethargy, headache, restlessness, tremors and convulsions. All borates cause similar effects; the lethal dose is over 30 grams. Poisoning initially stimulates the central nervous system before causing depression, as well as disturbing the digestive system, causing skin eruptions, and damage to the liver and kidneys. Borate is mostly eliminated from the body via the kidneys.

Eye: The dust may produce eye discomfort causing smarting, pain and redness. The material is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated.

Skin: Irritation and skin reactions are possible with sensitive skin. Open cuts, abraded or irritated skin should not be exposed to this material. The material may cause skin irritation after prolonged or repeated exposure and may cause on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

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 Effects: Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts. Borate can accumulate in the testes and deplete germ cells and cause withering of the testicles, according to animal testing. Hair loss, skin inflammation, stomach ulcer and anaemia can all occur. Repeated swallowing or inhalation irritates the stomach, causes a loss of appetite, disturbed digestion, nausea and vomiting, red rash, dry skin and mucous membranes, reddening of the tongue, cracking of the lips, inflamed conjunctiva, swelling of the eyelids and kidney injury. Animal testing revealed prolonged ingestion causes effects to the reproductive system in both males and females.

Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.

Mutagenic effects: No data available.

Reproductive or developmental effects: Studies have shown that oral administration of high doses showed effects on fertility and fetal development in various animal species. In humans, an epidemiological study showed that normal conditions of occupational exposure to boric acid dust does not indicate any effects on fertility, although the study was not sufficient to completely rule it out.

Aspiration hazard: Not classified.

Specific target organ toxicity: No data available.

Sensitisation (respiratory/contact): Not classified.

ECOLOGICAL INFORMATION

Ecotoxicity: Boric acid may be harmful in the environment in high concentrations. 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. To convert boric acid into equivalent boron (B) content, multiply by 0.1748.

Ecotoxicity Data:

Fish, (*Limandalimanda*), 96h LC50: 74 mg B/L†

Fish, (*Carassius auratus* - embryo-larval stage), 3 day LC50: 46 mg B/L‡

Fish, (*Carassius auratus* - embryo-larval stage), 7 day LC50: 178 mg B/L‡

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Crustacean, (*Daphnia magna*), 48h EC50: 133 mg B/L†
Algae (*Scenedesmus subspicatus*), 96h EC10: 24 mg B/L†

Chronic

Crustacean, (*Daphnia magna*), 21 day NOEC-LOEC: 6-13 mg B/L†
Fish, (*Salmo gairdneri* - embryo-larval stage), 24 day LC50: 150 mg B/L†
Fish, (*Salmo gairdneri* - embryo-larval stage), 32 day LC50: 100 mg B/L†
Test substance: †Sodium Tetraborate ‡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 the environment.

Persistence and Degradability: Boron is naturally occurring and ubiquitous in the environment.

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

Bioaccumulation: Log Pow = -0.7570 at 25°C

BOD and COD: No data available.

Products of Biodegradation: Boric acid decomposes in the environment to natural borate.

Toxicity of the Products of Biodegradation: No data available.

DISPOSAL CONSIDERATIONS

Disposal of Hazardous Substances is subject to the Resource Management Act and Council By-Laws in addition to HSNO requirements. Do not dispose with household rubbish.

Product: Recycle wherever possible. Special hazard may exist - specialist advice may be required. The product may be treated so that it is no longer hazardous by a means other than dilution. This includes incineration at an approved site or burial in a landfill in such a manner that it will not lead to any adverse health effects to any person or exceed any TEL (tolerable exposure limit) set by the Authority for this substance. Treatment in a biological wastewater treatment system with prior approval and arrangement is also permissible providing that the substance is rendered non-hazardous and does not pose any adverse effects to human health or the environment. Alternatively consult an approved Waste Management company for disposal options.

Packaging: Recycle wherever possible. Special hazard may exist - specialist advice may be required. Packaging should be rendered incapable of containing any material. Puncture containers to prevent re-use and bury at an authorised landfill. Empty containers may be decontaminated. The residual contents of the package must be diluted to below the thresholds for the respective hazard and the diluted residue is 1% or less of the volume of the package. Alternatively, consult an approved Waste Management company for disposal options or dispose of at an approved waste disposal facility. Observe all label safeguards until containers are cleaned and destroyed. Where possible retain label warnings and SDS and observe all notices pertaining to the product.

TRANSPORT INFORMATION

Not classified as a Dangerous Good under NZS 5433 Transport of Dangerous Goods on Land.

REGULATORY INFORMATION

HSNO Classifications: 6.4A, 6.8B, 9.1D
EPA Approval #: HSR002995 – Boric Acid

OTHER INFORMATION

End of SDS.

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