1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: Boric Acid

Recommended Use:

Supplier: Midland Chemicals
ABN: 91 622 018 986

Street Address: 18 Elliott Street
Midvale
Western Australia

Telephone Number: +61 08 9274 1992

Facsimile: +61 08 9250 1710

Emergency Telephone: **1 800 033 111 (ALL HOURS)**

2. HAZARDS IDENTIFICATION

Road and Rail; Non Dangerous Goods according to the criteria of the Australian Dangerous Goods Code (ADG Code).

Globally Harmonised System

Hazard Classification
Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

Hazard Categories
Toxic To Reproduction - Category 1B

Pictograms

Signal Word
Danger

Hazard Statements
H360FD May damage fertility. May damage the unborn child

Precautionary Statement

Prevention
P201 Obtain special instructions before use.
P281 Use personal protective equipment as required.
P406 Store locked up.

Response
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

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

Poisons Schedule: 5

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion
Boric Acid	10043-35-3	<=100%

4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor at once.

Inhalation:
Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention.

Skin Contact:
Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.

Eye Contact:
Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. If eye irritation persists, get medical advice/attention.

Ingestion:
Rinse mouth, then drink plenty of water. Get medical advice/attention if large amounts (i.e. more than one teaspoon) are swallowed or if you feel unwell. Never give anything by mouth to an unconscious person.

Medical attention and special treatment:
If exposed or concerned, get medical advice/attention. Observation only is required for adult ingestion of less than 6 grams of boric acid. For ingestion in excess of 6 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Haemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment.

5. FIRE FIGHTING MEASURES

Genral Measure

If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.

Flammability Conditions
Non-combustible; Material does not burn.

Extinguishing Media:
If material is involved in a fire, use extinguishing media that are appropriate to local circumstances and the surrounding environment.

Fire and Explosion Hazard
Boric acid is not flammable, combustible or explosive. The product is itself a flame retardant.

Hazardous products of combustion:
Fire or heat may produce irritating and/or toxic fumes, including Boron oxides.

Special Fire Fighting Instructions
Contain runoff from fire control or dilution water - Runoff may pollute waterways.

Personal protective equipment:
Wear self-contained breathing apparatus (SCBA) in combination with normal fire fighting clothing (full fire kit).

Flash Point
No Data Available

Lower Explosion Limit
No Data Available

Upper Explosion Limit
No Data Available

Auto Ignition Temperature
No Data Available

Hazchem Code
No Data Available

6. ACCIDENTAL RELEASE MEASURES

Emergency procedures:
Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas.
Use personal protective equipment as required (see SECTION 8).

Methods and materials for containment and clean up:
Ensure adequate ventilation. Do not touch or walk through spilled materials. Avoid dust formation Avoid breathing dust and contact with eyes, skin and clothing.
Collect material (vacuum, shovel or sweep up) and place it in suitable containers for later disposal (see SECTION 13).

7. HANDLING AND STORAGE

This material must be stored, maintained and used in accordance with the relevant regulations.

Conditions for safe storage:
Store in a cool, dry and well-ventilated place. Keep containers tightly closed when not in use. Protect from moisture. Avoid exposure to heat. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up.
Keep in the original container.

Precautions for safe handling:
Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Obtain special instructions before use - Do not handle until all safety precautions have been read and understood. Avoid dust formation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Avoid exposure to heat/overheating.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:
No specific exposure standards are available for this product. For dusts from solid substances without specific occupational exposure standards:
- Safe Work Australia Exposure Standard (Nuisance dusts): 8 hr TWA = 10 mg/m3 (measured as inhalable dust).

Exposure Limits:
No Data Available

Biological Limits:
No data Available

Engineering controls:
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 is source, prevent dispersion of it into the general work area.

Personal Protective Equipment:
Respiratory protection: Wear respiratory protection in case of inadequate ventilation or if an inhalation risk exists. Recommended: Dust mask/particulate respirator (refer to AS/NZS 1715 & 1716). -

Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Safety glasses with side-shields or goggles.

Hand protection: Handle with gloves. Recommended: Impervious gloves, e.g. Nitrile rubber. -

Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact.

Recommended: Impervious clothing; overalls, safety shoes.

Work Hygienic practices:

Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of the workday. Take off contaminated clothing and wash before storage or reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid crystals
Colour: White
Solubility: soluble in water (4.7% @ 20^{o}C)
Specific Gravity: 1.49-1.51
Bulk Density: 780-815 kg/m^{3}
Density: 1.49-1.51 g/cm^{3}
Relative Vapour Density (air=1): N/A
Vapour Pressure (20 °C): Negligible (@ 20 ^{o}C)
Molecular weight: 61.83 g/mol
Flash Point (°C): N/A
Flammability Limits (%): N/A
Auto Ignition Temperature (°C): N/A
Boiling Point/Melting Point (°C): 300^{o}C
Melting Point: 168-171^{o}C
pH: 6.1 (0.1% soln); 5.1 (1.0% soln); 3.7 (4.7% soln)

Properties That May Initiate or Contribute to Fire Intensity: Non-combustible; Material does not burn.

Reactions That Release Gases or Vapours: Fire or heat may produce irritating and/or toxic fumes, including Boron oxides.

Release of Invisible Flammable Vapours and Gases: Reaction with strong reducing agents, such as metal hydrides or alkali metals, will generate hydrogen gas, which could create an explosive hazard.

10. STABILITY AND REACTIVITY

General Information: Boric acid reacts as a weak acid which may cause corrosion of base metals. Reaction with strong reducing agents, such as metal hydrides or alkali metals, will generate hydrogen gas which could create an explosive hazard.

Chemical stability: 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 dust formation. Avoid exposure to moisture. Avoid exposure to heat/overheating.

Incompatible materials: **I**ncompatible/reactive with strong reducing agents, base metals.

Hazardous decomposition products: Fire or heat may produce irritating and/or toxic fumes, including Boron oxides.

Hazardous polymerisation: No information available.

11. TOXICOLOGICAL INFORMATION

General Information: - Acute toxicity: May be harmful if swallowed. Ingestion (or absorption) may cause nausea, vomiting, diarrhea, abdominal cramps; central nervous system (CNS) depression, ataxia and convulsions. - Skin corrosion/irritation: Non-irritant. - Eye damage/irritation: May cause eye irritation due to physical exposure to dust.

- Respiratory/skin sensitisation: Not a skin sensitiser. - Germ cell mutagenicity: Not considered to have mutagenic or genotoxic potential. - Carcinogenicity: Not likely to be carcinogenic. - Reproductive toxicity: May damage fertility. May damage the unborn child. Animal studies have demonstrated effects on testes, foetal weight loss and minor skeletal variations. However, (limited) epidemiological studies of workers and general populations exposed to boron show no reproductive or developmental effects [NICNAS]. - STOT (single exposure): Respiratory effects following inhalation of Boric acid dusts include nasal and eye irritation, throat irritation, coughing and breathlessness; these effects are most likely due to the physical exposure to dust; not considered a ‘serious irritation to the respiratory tract’ [NICNAS]. - STOT (repeated exposure): The main target organ for boron toxicity are the testes, leading to reproductive and developmental adverse effects. Adverse haematological effects have also been noted. - Aspiration toxicity: No information available.

Acute Toxicity

Ingestion: Acute toxicity (Oral): - LD50, Rats: 3,500 - 4,100 mg/kg bw.

Skin contact: Acute toxicity (Dermal): - LD50, Rabbits: >2,000 mg/kg bw.

Inhalation: Acute toxicity (Inhalation): - LC50, Rats: >2 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity Aquatic toxicity: - LC50, Fish (Pimephales promelas (Fathered minnow)): 79.7 mg B/L or 456 mg Boric acid/L (96 h). - EC50, Invertebrates (Daphnia magna): 133 mg B/L or 760 mg Boric acid/L (48 h). - EC50, Algae (Pseudokirchneriella subcapitata) biomass: 40 mg B/L or 229 mg Boric acid/L (72 h).

Persistence and Degradability
Boron is naturally occurring and ubiquitous in the environment. Boric acid decomposes in the environment to natural borate.

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

Environmental Fate 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. Prevent entry into drains and waterways.

Bioaccumulation Potential
Not significantly bioaccumulative.

Environmental Impact
No Data Available

13. DISPOSAL CONSIDERATIONS

General Information: Dispose of contents/container via a licensed disposal company and in accordance with local/regional/national regulations.

Special Precautions for Landfill: Small quantities of boric acid can usually be disposed of at landfill sites. Tonnage quantities of product are not recommended to be sent to landfills.

14. TRANSPORT INFORMATION

Road and Rail Transport
classified as Non Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail; NON DANGEROUS GOODS.

UN No: N/A
Class-Primary: N/A
Packing Group: N/A
Proper Shipping Name: Boric Acid

Hazchem Code: N/A

Marine Transport
classified as Non- Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; Non DANGEROUS GOODS.

UN No: N/A
Class-Primary: N/A
Packing Group: III
Proper Shipping Name: Boric Acid
Hazchem Code: N/A

Air Transport
classified as Non-Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

UN No: N/A
Class-Primary: N/A
Packing Group: III
Proper Shipping Name: Boric Acid
Hazchem Code: N/A

15. REGULATORY INFORMATION

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Poisons Schedule: 5

16. OTHER INFORMATION

This material safety data sheet has been prepared by Midland Chemicals

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace.

No liability is accepted whether direct or indirect from its application since the conditions of final use are outside Midland Chemicals control. The end user is obliged to conform to relevant government regulations and/or patent laws applicable in their respective States of Countries.