American Borate Company

Safety Data Sheet - Boric Acid

SECTION 1. Identification

1.1. Product identifier
Boric Acid

Index No 005-007-00-2
CAS 10043-35-3
ECN 233-139-2
REACH Registration number: 01-2119486683-25-0006

Trade names: Boric Acid

Chemical name/synonyms:
Orthoboric acid, boric acid

1.2. Details of the supplier of the safety data sheet

Supplier
Name: American Borate Company
Address: 5701 Cleveland Street, Suite 350, Virginia Beach, VA 23462
Phone No: (757) 490-2242 or (800)-486-1072

1.3. Emergency Phone Numbers:
Monday through Friday 8am – 5pm EST: (757) 490-2242 or (800) 486-1072
After 5pm and weekends: CHEMTREC 1-800-424-9300

1.4. Recommended use of the chemical and restrictions on uses advised against
The product is used in industrial manufacturing, particularly in:

Ceramics	Cosmetics	Pesticides
Detergent	Borosilicate glass	Textile fiberglass

There is no restriction on use of chemical.

SECTION 2. Hazard Identification

2.1. Classification of the substance

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Reproductive toxicity (Category 2), H361 Suspected of damaging fertility or the unborn child

2.2 GHS Label elements
Pictogram **Signal word** Warning

Hazard statements
H361 Suspected of damaging fertility or the unborn child.

Precautionary statements
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P281 Use personal protective equipment as required.
P308/P313 If exposed or concerned: Get medical advice/ attention.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

For Full text of R-S phrases as well as Hazard Class/Statements and Precautionary Statements see section 16.

Emergency overview
Boric acid is a white odorless, powdered substance that is not flammable, combustible, or explosive, and has low acute oral and dermal toxicity.

Potential health effects
Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because boric acid is poorly absorbed through intact skin.

Inhalation
Occasional mild irritation effects to nose and throat may occur from inhalation of boric acid dusts at levels higher than 10 mg/m^3.

Eye contact
Boric acid is non-irritating to eyes in normal industrial use.

Skin contact
Boric acid does not cause irritation to intact skin.

Ingestion
Products containing Boric Acid are not intended for ingestion. Boric Acid has a low acute toxicity. Small amounts (e.g., a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

Reproductive/developmental
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. A recent epidemiological study and a peer reviewing report of the past epidemiological studies conducted in China didn't show any negative effect of boron on human fertility (10, 11).

Potential ecological effects
Large amounts of Boric Acid can be harmful to plants and other species. Therefore, releases to the environment should be minimized.

Signs and symptoms of exposure
Symptoms of accidental over-exposure to Boric Acid have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting and diarrhea, with delayed effects of skin redness and peeling.

Refer to section 11 for details on Toxicological data.

SECTION 3. Composition/ Information on Ingredients

3.1. Substances:
The product contains greater than 99.9 percent (%) boric acid.
Formula H_3BO_3
Molecular Weight 61.84 g/mole

Chemical Name	Purity	CAS	ECN	REACH Registration No.	Hazard Statement
Boric Acid	99.9%	10043-35-3	233-139-2	01-2119486683-25-0006	H361

SECTION 4. First-aid Measures

4.1. Description of first aid measures
General advice
Move out of dangerous area. Seek medical attention. Show this safety data sheet to the doctor in attendance.

Skin contact
Wash with soap and water. Seek medical attention.

Eye contact
As with any chemical exposure to the eye, flush eyes with water for at least 20-minutes. Seek medical attention.

Inhalation
If symptoms such as nose or throat irritation are observed, remove person to fresh air. If not breathing, give artificial respiration. Seek medical attention.

Ingestion
If large amounts are swallowed (i.e. more than one teaspoon), give two glasses of water or milk to drink and seek medical attention. Never give anything by mouth to an unconscious person.

Note to physicians
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. Hemodialysis 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 (1) (see section 11).

4.2. Most important symptoms and effects, both acute and delayed
Described in labelling.

4.3. Indication of any immediate medical attention and special treatment needed.
No data available.

SECTION 5. Fire-fighting Measures Identification

5.1. Suitable Extinguishing media
Use fire extinguishing media suitable for surrounding fires.

5.2. Specific hazards arising from the chemical
None - Boric acid is non-flammable, combustible or explosive. The product is itself a flame retardant.

5.3. Special protective actions for fire-fighters
Firefighters should wear pressure demand, self-contained breathing apparatus and full turn-out gear.

SECTION 6. Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing dust. In case of exposure to prolonged or high level of airborne dust, wear a personal respirator in compliance with national legislation.

6.2. Environmental precautions
Boric acid is a water-soluble white powder that may, at high concentrations cause damage to trees or vegetation by root absorption (see section 12). Do not flush to drains.

6.3. Methods and materials for containment and cleaning up

Land spill
Vacuum, shovel or sweep up boric acid and place in containers for disposal in accordance with applicable local, state, and federal laws and regulations. Avoid contamination of water bodies during clean up and disposal. Avoid breathing dust.

Spillage into water
Where possible, remove any intact containers from the water. Advise 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 (see sections 12, 13 and 15).

6.4. Reference to other sections
See sections 8 and 13 for further information.

SECTION 7. Handling and Storage

7.1. Precautions for safe handling
To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in first out basis. Good housekeeping and dust prevention procedures should be followed to minimize dust generation and accumulation. Use with appropriate local exhaust ventilation. The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances.

7.2. Conditions for safe storage
Keep containers closed and store indoors in a dry well ventilated location.
Provide appropriate ventilation and store bags such as to prevent any accidental damage.

7.3. Specific end use
See section 1.4.

SECTION 8. Exposure Controls/Personal Protection

8.1. Control parameters

Occupational exposure limits for dust (total and resizable) *are treated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust"*

Respect regulatory provisions for dust (total and respirable).

ACGIH/TLV	10 mg/m^3
Cal OSHA/PEL	10 mg/m^3
OSHA/PEL (total dust)	15 mg/m^3

OSHA/PEL (respirable dust) 5 mg/m^3

DNEL values

Exposure pattern	Type/site of effect	Exposure route	DNEL value
DNELs for workers			
Long-term	Systemic	Inhalation	8.3 mg BA/m^3
Long-term	Systemic	Dermal	3924800 mg BA/day
DNELs for the general public			
Acute	Systemic	Oral	0.98 mg BA/kg bw/day
Long-term	Systemic	Dermal (external)	196 mg BA/kg bw/day
Long-term	Systemic	Dermal (systemic)	0.98 mg BA/kg bw/day
Long-term	Systemic	Inhalation	4.15 mg BA/m^3
Long-term	Systemic	Oral	0.98 mg BA/kg bw/day

Source: Chemical Safety Report of Boric Acid

PNEC values

PNEC $_{\text{add, freshwater, marine water}}$ = 1.35 mg B/L
PNEC $_{\text{add aqua intermittent}}$ = 9.1 mg B/L
PNEC $_{\text{add freshwater sediment, marine water sediment}}$ = 1.8 mg B/kg sediment dry weight
PNEC $_{\text{add, STP}}$ = 1.75 mg B/L
Source: Chemical Safety Report of Boric Acid

8.2. Exposure controls

8.2.1. Appropriate engineering controls
Maintain air concentrations below occupational exposure standards.

Use local exhaust ventilation to keep airborne concentrations of boric acid dust below permissible exposure levels. Wash hands before breaks and at the end of the workday. Remove and wash soiled clothing.

8.2.2. Individual protection measures, such as personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Eyes and hand protection
Handle with gloves. Wear eye protection suitable for job tasks.

8.2.3. Environmental exposure controls
No special requirement.

SECTION 9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical state	powder or crystalline solid
Color	white
Odor	odorless
Odor threshold	no data available
Molecular weight	61.83 g/mole
Specific gravity	1.51 gr/cm^3

pH @ 20°C		6.1 (0.1 % solution) 5.1 (1.0% solution) 3.7 (4.7 % solution)
Melting point		169 ± 1°C (heated in closed space)
Initial boiling point and boiling range		300 °C (full dehydration)
Flash point		Not applicable
Evaporation rate		Not applicable
Flammability (solid, gas)		Not flammable
Upper/lower flammability or explosive limits		Not applicable
Vapor pressure		Negligible @ 20°C
Vapor density		No data available
Relative density		1.49 gr/cm^3@ 23° C
Solubility in water		4.7% @ 20°C; 27.5% @ 100°C
Partition coefficient: n-octanol/water		Log Kow (Pow): -1.09 at 22 °C
Auto-İgnition temperature		Not applicable
Decomposition temperature		No data available
Viscosity		No data available
Explosion hazard		Non explosive
Oxidizing properties		No data available
Bulk density:	Granular	49.94 lbs/ft^3 (0.80 ton/m^3)
	Powder	37.46 lbs/ft^3 (0.60 ton/m^3)

SECTION 10. Stability and Reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
Boric acid is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. When heated it loses water, first forming metaboric acid (HBO_2), and on further heating it is converted into boric oxide (B_2O_3).

10.3. Possibility of hazardous reactions
Reaction with strong reducing agents such as metal hydrides or alkali metals will generate flammable hydrogen gas which could create an explosive hazard.

10.4. Conditions to avoid:
Exposure to moisture and incompatible materials.

10.5. Incompatible materials
Boric acid reacts as a weak acid which may cause corrosion of base metals. Avoid contact with strong reducing agents such as metal hydrides or alkali metals.

10.6. Hazardous decomposition products
Boranes, hydrogen, boron oxides.

SECTION 11. Toxicological Information

11.1. Information on toxicological effect

11.1.1. Substances

Acute toxicity
Low acute oral toxicity; LD_{50} in rats is 3,500 to 4,100 mg/kg of body weight.

Skin corrosion / irritation
Low acute dermal toxicity; LD_{50} in rabbits is greater than 2,000 mg/kg of body weight. Boric acid is poorly absorbed through intact skin. Non-irritating.

Serious eye damage/ irritation Non-irritating

Respiratory or skin sensitization: Boric acid is not a skin sensitizer.

Germ cell mutagenicity / carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes (2). Studies in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus including fetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to (3, 4, 5). Human epidemiological 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.

STOT-single exposure N.A.

STOT-repeated exposure N.A.

Aspiration hazard
Low acute inhalation toxicity; LC_{50} in rats is greater than 2.0 mg/l (or g/m^3).

SECTION 12. Ecological Information

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 undissociated boric acid. To convert boric acid into equivalent boron (B) content, multiply by 0.1748. Not persistent, not bio-accumulative.

12.1. Toxicity
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 minimize the amount of borate product released to the environment.

Algal toxicity (6)
Green algae, *Pseudokirchneriella subcapitata* (Hansveit and Oldersma, 2000)
72-hr EC50 –biomass = 40 mg B/L, or 229 mg boric acid/L.

Invertebrate toxicity (7)
Daphnia, Daphnids, *Daphnia magna* (Gersich, 1984a)
48-hr LC50 = 133 mg B/L or 760 mg boric acid/L or 619 mg disodium tetraborate , anhydrous/L

Fish toxicity (8)
Fish, Fathered minnow, *Pimephales promelas* (Soucek et al., 2010)
96-hr LC50 = 79.7 mg B/L or 456 mg boric acid/L or 370 mg disodium tetraborate, anhydrous

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

12.3. Bio-accumulative potential
Not significantly bio-accumulative.

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

12.5. Results of PBT and vPvB assessment No data available

12.6. Other adverse effects No data available

SECTION 13. Disposal Considerations

13.1. Disposal methods

Do not contaminate water, food, or feed by storage or disposal. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
Non-refillable bag! Completely empty bag into application equipment. Offer for recycling, if available; otherwise dispose of empty bag in a sanitary landfill or by incineration, or if allowed by state and local authorities, by burning. If burning stay out of smoke.

SECTION 14. Transport Information

Boric acid has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

US DOT
Not dangerous goods
IMDG
Not dangerous goods
IATA
Not dangerous goods

SECTION 15. Regulatory Information

15.1. Safety, health and environmental regulations/substance specific legislation

It should be noted that borates are safe under conditions of normal handling and use, besides, they are essential nutrients to plants, and research shows that they play a beneficial role in human health.

Chemical inventory listing

U.S. EPA TSCA Inventory	10043-35-3
Canadian DSL	10043-35-3
ECN	233-139-2
South Korea	1-439
Japanese MITI	(1)-63

Ensure all national/local regulations are observed.

SARA 302	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
SARA 311/312 Hazards	Chronic Health Hazard

Massachusetts Right to Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components
Boric acid CAS-No. 10043-35-3 Revision Date 2009-07-17

New Jersey Right To Know Components
Boric acid CAS-No. 10043-35-3 Revision Date 2009-07-17
California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Clean Air Act (Montreal Protocol)
Boric acid was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

Cosmetics
The EC Directive 76/768/EEC sets an upper limit of 5% Boric acid in talc, 0.5% in oral hygiene products and 3% in other products. In addition, the talc should not be used on children under 3 years of age.

EU Reach Regulation

Boric Acid is listed in the Candidate List of Substances of Very High Concern "SVHC" for eventual inclusion in Annex XIV to REACH Regulation 1907/2006 ("Authorization List"). (18.06.2010-ED/30/2010).

Boric acid is listed in the Annex XVII of REACH Regulation 1907/2006 (EU No.109/2012) and its use in consumer products above specific concentration limits is restricted. Note that this restriction is only specific to consumer products and do not cover its industrial and/or professional applications. Boric acid can be used in consumer products below specific concentration limits (which is C ≥5.5% for Boric Acid).

15.2 FIFRA Statement
This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

EPA Reg. No. 73605-2
EPA Est. 73605-VA-01

Precautionary Statements:
CAUTION: Not for food or drug use
CAUTION: Keep out of reach of children
CAUTION: Harmful if swallowed.

Hazards to Humans & Domestic Animals: Causes moderate eye irritation. Avoid contact with eyes or clothing. Thoroughly was with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using toilet.

Environmental Hazards: Boric Acid or boric acid solutions carelessly spilled or applied to cropland or growing plants, including trees and shrubs, may kill or seriously retard plant growth. Do not contaminate water by cleaning of equipment or disposal of wastes. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board, or regional EPA office.

SECTION 16. Other Information

Full text of H-Statements referred to under sections 2 and 3.

H361 Suspected of damaging fertility or the unborn child

References

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10. Scialli AR, Bonde JP, Brüske-Hohlfeld I, Culver D, Li Y, Sullivan FM; ELSEVIER 2009
11. Robbins WA, Xun L, Jia J, Kennedy N, Elashoff DA, Ping L. ;ELSEVIER 2009;(Reproductive Toxicology)

For general information on the toxicology of borates see ECETOC Technical Report No. 63 (1995); Patty's Industrial Hygiene and Toxicology, 4th Edition Vol. II, (1994) Chap. 42, Boron.

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