

BORIC ACID SAFETY DATA SHEET

Date of Issue : March 2007
Revision No : 5
Date of Revision : January 2016

ETI MADEN ISLETMELERI GENEL MUDURLUGU

Ayvalı Mah. Halil Sezai Erkut Cad. Afra Sok. No. 1/A, 06010, Keçiören, Ankara, TURKEY

SECTION 1. Identification

1.1. GHS Product Identifier

Boric Acid

1.2. Other means of identification

Chemical name/synonyms: Boric acid, Orthoboric acid, boracic acid

1.3. Recommended use of the chemical and restrictions on use

The product is used in industrial manufacturing, in particular in:

- Ceramics
- Cosmetics
- Detergent
- Borosilicate glass
- Textile fibreglass

There is no restriction on use of chemical.

1.4. Supplier's details

Name : ETI MADEN İŞLETMELERİ GENEL MUDURLUGU

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SECTION 2. Hazard Identification

2.1. Classification of the substance

Reproductive toxicant, Category 2

H 361d : Suspected of damaging the unborn child

Acute Oral 5

H303: May be harmful if swallowed.

2.2. GHS Label elements, including precautionary statements



H361d: Suspected of damaging the unborn child

H303: May be harmful if swallowed

Warning

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P308 + P313: If exposed or concerned: get medical advice/attention.

P312: Call a POISON CENTER/doctor/physician if you feel unwell.

P405: Store locked up.

2.3. Other hazards which do not result in classification

Boric acid is a white odourless, 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 greater than 10 mg/m³.

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.

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 diarrhoea, 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 (H₃BO₃).

Chemical Name	EC No/CAS No	Purity, %
Boric Acid (Orthoboric acid, boracic acid)	233-139-2 10043-35-3	min. 99.9

For other "Chemical inventory listing", please refer to section 15.

SECTION 4. First aid measures

4.1. Description of first aid measures

Skin contact

No treatment necessary because boric acid has low dermal toxicity.

Eye contact

No treatment necessary because non-irritant.

Inhalation

If symptoms such as nose or throat irritation are observed, remove person to fresh air. Boric acid has low inhalation toxicity.

Ingestion

If large amounts are swallowed (i.e. more than one teaspoon), contact a doctor or toxicity centre immediately.

Note to physicians

Observation only is required for adult ingestion of less than 4 grams of boron oxide. For ingestion in excess of 4 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

N.A.

4.3. Indication of any immediate medical attention and special treatment needed

N.A.

SECTION 5. Fire-fighting measures

5.1. Suitable Extinguishing media

Any fire extinguishing media may be used on nearby fires.

5.2. Specific hazards arising from the chemical

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

5.3. Special protective actions for fire-fighters

N.A.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation. 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).

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 regulations. Avoid contamination of water bodies during clean up and disposal. No personal protective equipment is needed to clean up land spills.

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).

SECTION 7. Handling and Storage

7.1. Precautions for safe Handling

To maintain package integrity and to minimise 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 minimise dust generation and accumulation. Your supplier can advise you on safe handling, please contact the supplier.

7.2. Conditions for safe storage, including any incompatibilities

Dry, indoor storage is recommended since the product is highly hygroscopic.

SECTION 8. Exposure controls / Personal protection

8.1. Control parameters

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

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

8.2. 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.

8.3. Individual protection measures, such as personal protective equipment

Respiratory protection

In case of prolonged exposure to dust wear a personal respirator in compliance with national legislation (make reference to the appropriate CEN standart)

Where airborne concentrations are expected to exceed exposure limits, respirators should be used.

Eyes and hands protection

Goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	white solid, granular/powder
Odour	odourless
Odour threshold	N.A.
pH @ 20°C	6.1 (0.1 % solution) 5.1 (1.0% solution) 3.7 (4.7 % solution)
Melting point	450°C
Boiling point	1860°C
Flash point	Non flammable
Evaporation rate	N.A.
Flammability	N.A.
Upper/lower flammability or explosive limits	Non explosive
Vapour pressure	Negligible @ 20°C
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	N.A.
Auto-Ignition temperature	N.A.
Decomposition temperature	169±1 toHBO ₂ & -1 ½ H ₂ O at 300 °C
Viscosity	N.A.

9.2. Other information

Molecular weight	61.83
Specific gravity	1.51 @ 20°C

SECTION 10. Stability and reactivity

10.1. Reactivity

N.A.

10.2. 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 boron oxide (B₂O₃).

10.3. Possibility of hazardous reactions

Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

10.4. Conditions to avoid:

N.A.

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

10.6. Hazardous decomposition products

N.A.

SECTION 11. Toxicological information

11.1. Information on toxicological effect

11.1.1. Substances

Acute toxicity⁽²⁾

Low acute oral toxicity; LD₅₀ in rats > 2600 mg/kg of body weight (Test material: Boron Oxide) (Denton SM, 1996).

Skin corrosion/irritation

Low acute dermal toxicity; LD₅₀ in rabbits is greater than 2,000 mg/kg of body weight. Boric acid is poorly absorbed through intact skin⁽²⁾. Non-irritant.

Serious eye damage/irritation

Non-irritant. Boric acid is not a skin sensitizer.

Respiratory or skin sensitization

Boric acid is not a skin sensitizer.

Germcell mutagenicity

Boric acid is not mutagenic.

Carcinogenicity

Boric acid is not carcinogenic

Reproductive/Developmental toxicity

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes^[2]. 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^[3,4,5]. 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^(6,7,8).

STOT-single exposure

N.A.

STOT-repeated exposure

N.A.

Aspiration Hazard

Boric acid has no aspiration hazard.

SECTION 12. Ecological information

12.1. Toxicity

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.

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.

Algal toxicity⁽⁹⁾

Green algae, *Pseudokirchneriella subcapitata* (Hansveit and Oldersma, 2000)

72-hr EC₅₀ –biomass = 40 mg B/L, or 229 mg boric acid/L

Invertebrate toxicity⁽¹⁰⁾

Daphnia, Daphnids, *Daphnia magna* (Gersich, 1984a)

48-hr LC₅₀ = 133 mg B/L or 760 mg boric acid/L

Fish toxicity⁽¹¹⁾

Fish, Fatheted minnow, *Pimephales promelas* (Soucek et al., 2010)

96-hr LC₅₀ = 79.7 mg B/L or 456 mg boric acid/L

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. Bioaccumulative potential

Not significantly bioaccumulative.

12.4. Mobility in soil

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

12.5. Other adverse effects

No Data Available.

SECTION 13. Disposal considerations

13.1. Disposal methods

Small quantities of boric acid can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be used for an appropriate application.

SECTION 14. Transport information

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

- 14.1. UN number** : N.A.
14.2. UN proper shipping name : N.A.
14.3. Transport of hazard classes : N.A.
14.4. Packing group : N.A.
14.5. Environmental hazards : N.A.
14.6. Special precautions for user : N.A.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: N.A.

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations

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. CLP classification has been solely based on animal tests where animals were exposed to high doses of boric acid over long periods of time. These doses were many times higher than humans are exposed to under conditions of normal handling and use. Consequently, a precautionary decision was taken by the European Commission. Although we will comply with the body of legislation triggered by that decision, we are in process of all possible legal actions.

Clean Air Act (Montreal Protocol)

Boric acid was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

Chemical inventory listing

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

Ensure all national/local regulations are observed.

SECTION 16. Other information

16.1. Mainly changes made to the previous version of this Material Safety Data Sheet (MSDS):

- This MSDS complies with ISO 11014; the requirements of UN-GHS

Revision No	Revision content
05	<ul style="list-style-type: none"> This SDS is updated in accordance with the GHS (Rev.6) (2015)-Guidance on the Compilation of Safety data Sheets. This SDS is updated in line with Eti Maden Corporate identity.

16.2. List of abbreviation and acronyms used in this MSDS

Eti Maden	: Eti Maden İşletmeleri Genel Müdürlüğü
SDS	: Safety Data Sheets
Index N°	: Atomic number of the element most characteristic of the properties of the substance
CAS No	: Chemical Abstracts Service number
EC No	: EINECS Number : European Inventory of Existing Commercial Substances
Repr. Cat. 2	: Substance presumed human reproductive toxicant
Acute Oral Cat. 5	: Substance which is of relatively low acute oral toxicity.
GHS	: Globally Harmonised System of Classification and Labelling
LD₅₀	: Median Lethal Dose
LC₅₀	: Lethal Concentration, 50%
N.A.	: Not Applicable
OSHA	: Occupational Safety & Health Administration
Cal OSHA	: The State of California Division of Occupational Safety and Health (DOSH)
PEL	: Permissible Exposure Limits
ACGIH	: American Conference of Governmental Industrial Hygienists
TLV	: Threshold Limit Value
Japanese MITI	: Japanese Ministry of International Trade and Industry
EC₅₀	: Half maximal effective concentration
UN	: United Nations

U.S. EPA TSCA Inventory: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the authority of the Environmental Protection Agency

Canadian DSL: Canadian Domestic Substances List

16.3. List of relevant hazard statements and precautionary statements used in this MSDS

Hazard Statement
H361 d: Suspected of damaging the unborn child
H303: May be harmful if swallowed
Precautionary Statements
<u>Prevention</u>
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
<u>Response</u>
P308 + P313: If exposed or concerned: get medical advice/attention.
P312: Call a POISON CENTER/doctor/physician if you feel unwell
<u>Storage</u>
P405: Store locked up.
<u>Disposal:</u>
P501: Dispose of contents/container to in accordance with local regulations.

16.4. References

1. Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. (1986), 4, 427-458
2. Denton SM (1996). Acute oral toxicity study in the rat: anhydrous boric acid. Final report. Report no.: 1341/7-1032.
3. National Toxicology Program (NTP) – Technical Report Series No. TR324, NIH Publication No. 88-2580 (1987), PB88 213475/XAB
4. Fail *et al.*, Fund. Appl. Toxicol. (1991) 17, 225-239
5. Heindel *et al.*, Fund. Appl. Toxicol. (1992) 18, 266-277
6. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085
7. Scialli AR, Bonde JP, Brüske-Hohlfeld I, Culver D, Li Y, Sullivan FM; ELSEVIER 2009
8. Robbins WA, Xun L, Jia J, Kennedy N, Elashoff DA, Ping L. ;ELSEVIER 2009;(Reproductive Toxicology)
9. Hansveit and Oldersma, 2000; TNO Nutrition and Food Research Institute. Report No. V99.157.
10. Gersich, FM (1984a). Environ.Toxicol.Chem., 3 #1, 89-94 (1984)
11. Soucek *et al.*, 2010. Illinois Natural History Survey, University of Illinois.

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'.

16.5. Disclaimer of Liability

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