

Boric Acid

SECTION 1: Identification of the mixture and of the company/undertaking

1.1 Product identifier

Substance name

Orthoboric acid, Boric Acid

CAS-No.: 10043-35-3

EC-No.: 233-139-2

REACH Registration No.: 01-2119486683-25-0006

1.2 Relevant identified uses of the substance or mixture and uses advised against

The product is used in industrial manufacturing, in particular in:
Ceramics, cosmetics, detergents, borosilicate glass, textiles, fibreglass

1.3 Details of the supplier of the safety data sheet

Industrial Chemicals Limited
Hogg Lane
Grays
RM17 5DU
United Kingdom

Tel: +44 (0) 1375 389000

E mail: sds@icgl.co.uk

1.4 Emergency telephone number

Emergency only Tel: +44 (0) 1865 407333

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture

2.1.1 Classification in accordance with the Dangerous Substances Directive 67/548/EEC(DSD)

Repr. Cat. 2; R60-R61

Concentrations limits: C ≥5.5%: R;R60-61

2.1.2 Classification in accordance with the Classification Labelling and Packaging Regulation EC (no) 1272/2008[EU-GHS/CLP]

Harmonised classification provided in the 1st ATP to CLP (Regulation EC n°790/2009)

Repr. Cat. 1B; H360FD

Specific concentrations limits: Repr. 1B; H360FD: C ≥5.5%

Precautionary Statement Prevention: P201; P202; P281

Precautionary Statement Response: P308 + P313

Precautionary Statement Storage: P405

Precautionary Statement Disposal: P501

2.1.3. Additional information

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

2.2 Label elements

2.2.2.1 Labelling according Regulation (EC) No 1272/2008 [CLP]

Boric Acid
CAS No: 10043-35-3, EC No: 233-139-2

Pictogram(s)



Signal word
Danger

Hazard statements:

H 360FD: May damage fertility or the unborn child.

Precautionary statements

P201: Obtain special instruction 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.

2.2.2. According to REACH, Annex XVII

Restricted to professional users

2.3 Other Hazards

Emergency overview

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 higher 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.

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 diarrhoea, with delayed effects of skin redness and peeling.

Refer to section 11 for details on Toxicological data.

SECTION 3: Composition**3.1 Substances**

Chemical Name	EC N° CAS Number	Registration number	Purity	Risk phrases (DSD)	Hazard statement (CLP)
Boric acid	233-139-2 10043-35-3	01-2119486683-25-0006	99.9%	R60; R61	H 360FD

3.2 Mixtures**SECTION 4: First Aid Measures****4.1 Description of first aid measures****Skin contact**

No treatment necessary because non-irritating.

Eye contact

No treatment necessary because non-irritant.

Inhalation

If symptoms such as nose or throat irritation are observed, remove person to fresh air.

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.

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. 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 (see section 11).

4.2 Most important symptoms and effects, both acute and delayed

N.A. (Not Applicable)

4.3 Indication of any immediate medical attention and special treatments needed

N.A.

SECTION 5: Firefighting Measures**5.1 Extinguishing media**

Any fire extinguishing media may be used on nearby fires.

5.2 Special hazards arising from the substance or mixture

Exposure hazards: None. Because, boric acid is not flammable, combustible or explosive. The product is itself a flame retardant.

5.3 Advice for fire fighters

N.A.

5.4 Further information

no data available

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 material for containment and cleaning up:

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.

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 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:

No special handling precautions are required, but dry, indoor storage is recommended. No specific requirements. Provide appropriate ventilation and store bags such as to prevent any accidental damage.

7.3. Specific end use(s)

The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances.

SECTION 8. Exposure Controls/Personal Protection**8.1. Control parameters**

State	8 hour TWA	15 min. STEL
UK	1 mg/m ³	3 mg/m ³

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 add, freshwater, marine water= 1.35 mg B/L

PNEC add aqua intermittent= 9.1 mg B/L

PNEC add freshwater sediment, marine water sediment= 1.8 mg B/kg sediment dry weight

PNEC add, STP= 1.75 mg B/L

Source: Chemical Safety Report of Boric Acid

8.2 Exposure controls

8.2.1. Appropriate engineering controls

No data available

8.2.2. Individual protection measures, such as personal protective equipment

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.

Respiratory protection

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

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.

8.2.3. Environmental exposure controls

No special requirement.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

State:	Crystalline solid
Colour:	White
Odour:	Odourless
Evaporation rate:	NA
Oxidising:	NA
Solubility in water:	4.7% @ 20°C; 27.5% @ 100°C
Viscosity:	NA
Melting Point:	171°C
Flammability limits %:	NA
Flash point°C:	non flammable
Part.coeff. n-octanol/water:	No Data Available
Autoflammability°C:	NA
Relative density:	1.51 @ 20°C
pH	6.1 (0.1 % solution) 5.1 (1.0% solution) 3.7 (4.7 % solution)

9.2. Other information

Molecular weight	61.83
Molecular formula	B(OH) ₃

SECTION 10: Stability and Reactivity

10.1. Reactivity

NA

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 boric 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

NA

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: NA

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

11.1.1. Substances

Acute toxicity

Low acute oral toxicity; LD50 in rats is 3,500 to 4,100 mg/kg of body weight.

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. Non-irritant.

Serious eye damage/ irritation

Non-irritant.

Respiratory or skin sensitisation: N.A.

Germ cell mutagenicity N.A.

Carcinogenicity N.A.

Reproductive toxicity

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes. Studies 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. 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; LC50 in rats is greater than 2.0 mg/l (or g/m³).

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 bioaccumulative.

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 minimise the amount of borate product released to the environment.

Algal toxicity

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

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

Invertebrate toxicity

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

Fish, Fatheted 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. Bioaccumulative potential

Not significantly bioaccumulative.

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 N.A.

12.6. Other adverse effects No Data Available

SECTION 13: Disposal Considerations

13.1. Waste treatment 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.

SECTION 15: Regulatory Information

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

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.

Cosmetics

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

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.

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 ("Authorisation List"). (18.06.2010-ED/30/2010).

15.2 Chemical Safety Assessment

Chemical Safety Assessment of Boric Acid has been carried out under REACH Regulation of the EU.

SECTION 16: Other Information

16.1. List of relevant R phrases, hazard statements, safety phrases and/or precautionary statements used in this MSDS

According to DSD Directive

Risk Phrases

R60 : May impair fertility

R61 : May cause harm to the unborn child

Safety phrases

S45: In case of accident or if you fell unwell, contact a doctor or poisons information centre immediately (show the label where possible).

S53: Avoid exposure-obtain special instructions before use.

According to CLP Regulation

Hazard Statement

H360 FD: May damage fertility or the unborn child

Precautionary statements

Prevention

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.

Response

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

Storage

P405: Store locked up.

Disposal:

P501 : Dispose of contents/container to in accordance with local regulations.

This Safety Data Sheet is prepared in accordance with formatting described in the REACH Regulation (EC) No 453/2010, and described in CLP Regulation (EC) No 1272/2008. It contains information concerning the potential risks to those involved in handling, transporting and working with the material, as well as describing potential risks to the environment. This information must be made available to those who may come into contact with the material or are responsible for its use.

The information given in this data sheet is for guidance only and does not constitute a risk assessment under the COSHH Regulations. It is provided in good faith and to the best of our knowledge, but no warranty, express or implied, is made.