SAFETY DATA SHEET
99.9%
BORIC ACID

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. PRODUCT IDENTIFIER

Product name: Boric Acid

Product No.: BO

CAS-No.: 10043-35-3

EC No.: 233-139-2

Synonyms: Boron, Boron Trioxide Trihydrate, Boracic acid, Hydrogen borate, Orthoboric acid

Molecular formula: H_3BO_3

1.2. RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

Identified use: As an antiseptic,
As an insecticide, preservative and lubricant
In nuclear power plant,
In pyrotechnics,
As pH buffer,
Flame Retardant,
Cleaning agent and detergent,
Reagent Chemical.

Uses advised against: No specific uses advised against are identified

1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

HD Chemicals LTD
UNIT 9 Scott Business Park
PL2 2PB Plymouth UK

Contact Person responsible for SDS: Mr Peter Konefal, e-mail: contact@hdchemicals.co.uk

SECTION 2: HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

Classification (EC 1272/2008)

Physical and Chemical Hazards:	Not classified.
Human health:	Repr. 1B - H360FD
Environment:	Not classified.
Classification (67/548/EEC)	Repr. Cat. 2;R60, R61

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 2.2.

Emergency overview: Boric Acid is a white, odourless, crystalline substance that is not flammable, combustible or explosive, and it presents no unusual hazard if involved in a fire. Boric Acid presents little or no hazard(to humans) and has low acute oral and dermal toxicities. Care should be taken to minimize the amount of Boric Acid released to the environment to avoid ecological effects. Boric Acid is not considered a carcinogen.

Routes of exposure: In the occupational setting, inhalation is the most important route of exposure. Dermal absorption is usually not important because Boric Acid is not absorbed through the intact skin.

Eyes: Exposure to Boric Acid dust does not cause eye irritation in normal industrial use.

Skin: Boric Acid is non-irritating to the intact skin. Can be readily absorbed through broken or abraded skin.

Inhalation: Mild irritation to nose and throat may occur when the PEL or TLV are exceeded.

Ingestion: Boric Acid products are not intended for ingestion. Amounts greater than one teaspoonful, when ingested, may cause gastrointestinal problems.

Target organs: No target organs have been determined in humans. High dose animal ingestion studies indicate that the testes is the target organ.

Chronic effects: A human study of occupationally exposed Borate worker population showed no adverse reproductive effects. Animal studies of similar organic Borates demonstrated reproductive effects in males.

General Hazard

Boric Acid is not flammable, combustible, or explosive. Boric Acid presents no unusual hazards when involved in a fire. This product is an inherent fire retardant.

2.2. LABEL ELEMENTS

Label In Accordance With (EC) No. 1272/2008

Hazards not otherwise Classified – Combustible Dust
Reproductive Toxicity – Repr. 1

SIGNAL WORDS

Danger

RISK PHRASES

R60	May impair fertility
R61	May cause harm to the unborn child

HAZARD PHRASES

H360FD	May damage fertility or the unborn child

PROTECTION PHRASES

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+313	IF exposed or concerned: Get medical advice/attention
P405	Store locked up
P501	Dispose of contents/container to comply with local, state and federal regulations

SAFETY PHRASES

S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible)
S53	Avoid exposure - obtain special instructions before use

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

NOT CLASSIFIED AS PBT/VPVB BY CURRENT EU CRITERIA.

Composition information – main constituents

Substance name	Mol. Formula	Typical conc. (%w/w)	EC No.	CAS-No.
BORIC ACID	H_3BO_3	≥99.99%	233-139-2	10043-35-3

SECTION 4: FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID MEASURES

Inhalation: No specific treatment is necessary since Boric Acid is not likely to be hazardous by inhalation. However, prolonged exposure to dust levels in excess of regulatory limits should always be avoided. If symptoms occur, move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

Ingestion: If amounts greater than one teaspoon are swallowed, give two glasses of water to drink and seek medical attention. Provide rest, warmth and fresh air. Immediately rinse mouth. NOTE TO PHYSICIAN: See section 4.3.

Skin contact: Boric Acid is non-irritating in the normal occupational setting. If irritation occurs, wash affected area with soap or mild detergent and large amounts of water. Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if any discomfort continues.

Eye contact: Continuously flush exposed eyes, occasionally lifting the upper and lower lids. Remove any contact lenses and open eyes wide apart. Get medical attention if irritation persists.

4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Symptoms of accidentalover-exposure to Boric Acid have been associated with ingestion or by absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling. May cause reproductive harm or birth defects based on animal data.

Inhalation: Dust causes respiratory tract irritation.

Ingestion: Causes digestive (gastrointestinal) tract irritation with nausea, vomiting and diarrhoea. May also affect behaviour, brain, the Central Nervous System (depression, headache, dizziness, drowsiness, collapse, unconsciousness, coma), Peripheral Nervous System,

cardiovascular system, blood, liver, urinary system (kidney, ureter, bladder) and endocrine system.

Skin contact: May cause skin irritation. May be absorbed through damaged or abraded skin in harmful amounts. If absorbed through skin it may affect behaviour, sense organs, metabolism, the gastrointestinal tract and the respiratory tract (respiratory depression).

Eye contact: Dust causes eye irritation.

Chronic Potential Health Effects: Boric acid can accumulate in the body (brain, bone) with repeated exposure. Prolonged or repeated skin contact may cause dermatitis. May cause borism characterized by dry skin, skin eruptions and gastric disturbances.

4.3. INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

Adult ingestion of a few grams requires observation only. For ingestion in excess of 6 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialys is should be reserved for massive acute ingestion or patients with renal failure. Boric Acid analysis of urine or blood is useful only for documenting exposure and should not be used for evaluating severity of poisoning or to guide treatment.

SECTION 5: FIREFIGHTING MEASURES

5.1. EXTINGUISHING MEDIA

Boric Acid is not flammable, combustible, or explosive. This product is an inherent fire retardant. Any fire extinguishing media may be used on nearby fires. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media: N/A

5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Boric Acid presents no unusual hazards when involved in a fire. Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard. A mixture of potassium and boric acid may explode on impact. A mixture of boric acid and acetic anhydride will explode when heated to 58-60 C.

5.3. ADVICE FOR FIRE-FIGHTERS

Wear self-contained breathing apparatus and full protective clothing. Keep all unnecessary people away. Move containers from fire area if you can do it without risk or keep cool with water spray as protective measure, where feasible. Use spark-proof tools and explosion-proof equipment.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

If dusty, wear protective clothes described in Section 8.1. Transfer to a disposal or recovery container. Use spark-proof tools and explosion proof equipment. Use respiratory protective device against the effect of fumes/dust. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources. Protect from heat.

6.2. ENVIRONMENTAL PRECAUTIONS

Boric Acid will cause localized contamination of surrounding waters depending on amount dissolved in these waters. Some damage to local vegetation, fish, and other aquatic life may be expected. Prevent from reaching drains or waterway. Boric Acid may damage trees and vegetation.

6.3. METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

For dry spills, sweep, vacuum, or shovel and place in containers for disposal in accordance with applicable regulations. Avoid contamination of bodies of water during clean-up.

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

SECTION 7: HANDLING AND STORAGE

7.1. PRECAUTIONS FOR SAFE HANDLING

Keep locked up. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as alkalis.
To maintain package integrity and to minimize caking of the product, bags should be handled on a "first-in-first-out" basis. Good housekeeping should be maintained to minimize dust accumulation and generation. Boric Acid may cake in moist conditions. Wash hands thoroughly with soap and water after handling, and before eating, drinking, or smoking.

7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Dry, indoor storage under normal atmospheric conditions is recommended. Keep this material away from food, drink and animal feed. Keep out of the reach of children. Do not store above 23°C (73.4°F)

7.3. SPECIFIC END USE(S)

For industrial use only.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. CONTROL PARAMETERS/EXPOSURE GUIDELINES

Occupational Exposure Limit Values:

Substance:	**Boric acid and sodium borate**			
CAS No.:	**10043-35-3**			
	Limit value-Eight hours		Limit value – Short term	
	ppm	mg/m3	ppm	mg/m3
Belgium		2		6
Germany (AGS)		0.5		1 (1)
Germany (DFG)		10 inhalable aerosol (1)		10 inhalable aerosol (1,2)
Switzerland		10 inhalable aerosol		10 inhalable aerosol

Source :IFAInstitutfürArbeitsshutz der DeutschenGesetzlichenUnfallversicherung

Remarks

Germany (AGS)	(1) 15 minutes average value
Germany (DFG)	(1) calculated as boron: 1.8 mg/m3 (2) 15 minutes average value

Respect regulatory provisions for dust (total and respirable).

ACGIH/TLV	10 mg/m3
Cal OSHA/PEL	10 mg/m3
OSHA/PEL (total dust)	15 mg/m3
OSHA/PEL (respirable dust)	5 mg/m3

Engineering controls: Use local exhaust ventilation to keep airborne levels below exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Protective equipment:

Wear suitable goggles, glovesand suitable mask in excessively dusty conditions.

Respiratory equipment: If ventilation is insufficient suitable respiratory protection must be provided.

Hand protection: Not required under normal conditions. Use if excessively dusty or if skin is damaged.

Eye/Face protection: Use goggles or vented safety glasses in excessively dusty conditions.

Hygiene measures: DO NOT SMOKE IN WORK AREA! Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Powder
Colour:	White
Odour:	Odourless
Taste:	Bitter (slight)
Solubility:	Soluble in water/ 4.7% at 20 °C; 27.5% at 100 °C
Initial boiling point (°C):	300°C
Melting point (°C):	169 °C
Critical temperature:	Not available
Specific gravity:	1.435 (Water=1)
Vapour density:	Not available
Vapour pressure:	Not available
pH-Value, Diluted Solution:	At 20 C: 1% solution - 5.1 (Acid)

Flash point (°C):	Not applicable.
Molecular weight:	61.83 g/mol
Molecular formula:	H_3BO_3

SECTION 10: STABILITY AND REACTIVITY

10.1. REACTIVITY

Boric Acid reacts as a weak acid which may cause corrosion of base metals.

10.2. CHEMICAL STABILITY

Stable under normal conditions; forms partial hydrate in moist air. When heated, water is lost forming Meta boric Acid (HBO_2). On further heating, the material is converted to 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 hydrogen gas which could create an explosive hazard.

10.4. CONDITIONS TO AVOID

High temperatures, dust generation, incompatible materials.

10.5. INCOMPATIBLE MATERIALS

Reactive with alkalis. Incompatible with Potassium, Acetic Anhydride. Reacts with basic materials to form borate salts.

10.6. HAZARDOUS DECOMPOSITION

No hazardous decomposition or polymerization occurs.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Acute effects:	Causes severe burns
Acute Toxicity (Oral LD50);	Low acute dermal toxicity;
Chronic effects:	Prolonged or repeated exposure may cause damage to kidneys, cardiovascular system, central nervous system (CNS). Possible negative impact on reproductive system. Toxic to Reproductive Health Category 2.
General information:	Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Inhalation: Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposure to Boric Acid and Sodium Borate dust.

Ingestion: Low acute oral toxicity.

Skin contact: Boric Acid was applied to the skin of albino rabbits. Slight to irritation persisted 72 hours after application. No evidence of tissue damage was found.

Eye contact: Fifty years of occupational exposure history indicates no human eye injury from exposure to Boric Acid.

Boric Acid, when applied to the eyes of albino rabbits (Draize test), produced effects of mild erythema and mild to moderate discharge in 5 of 6 rabbits. All signs subsided by the fourth day after application.

Reproductive: May cause reproductive harm or birth defects based on animal data. A human study of occupationally exposed Borate worker population showed no adverse reproductive effects. Animal studies indicate that Boric Acid reduces or inhibits sperm production, causes testicular atrophy, and, when given to pregnant animals during gestation, may cause developmental changes. These feed studies were conducted under chronic exposure conditions leading to doses many times in excess of those that could occur through inhalation of dust in the occupational setting.

Target Organs: N/A

Boric Acid is not listed as a carcinogen.

Non mutagenic activity was observed for Boric Acid in a recent battery of four short-term mutagenicity assays.

SECTION 12: ECOLOGICAL INFORMATION

Eco toxicity: The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

12.1. TOXICITY

Acute Toxicity – Fish
LC50 96 hours 58 - 326 mg/l
OECD 203

Acute Toxicity - Aquatic Invertebrates
EC50 48 hours 31 - 457 mg/l Daphnia magna
OECD 202

12.2. PERSISTENCE AND DEGRADABILITY

There are no data on the degradability of this product.

12.3. BIOACCUMULATIVE POTENTIAL

No data available on bioaccumulation.

12.4. MOBILITY

The product is water soluble and may spread in water systems.

12.5. RESULTS OF PBT AND VPVB ASSESSMENT

Not Classified as PBT/vPvB by current EU criteria.

12.6. OTHER ADVERSE EFFECTS

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

General information: Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

Waste treatment methods: Dispose of waste and residues in accordance with local authority requirements.

SECTION 14: TRANSPORT INFORMATION

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

UN number

No information required.

UN proper shipping name

No information required.

Transport hazard class(es)

No information required.

Packing group

No information required.

Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant
No.

Special precautions for user

No information required

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE

Statutory Instruments

The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (S.I 2009 No. 716).

Approved Code Of Practice

Safety Data Sheets for Substances and Preparations. Classification and Labelling of Substances and Preparations Dangerous for Supply.

Guidance Notes

CHIP for everyone HSG(108).

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments. Regulation (EC) No 1272/2008of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending. Regulation (EC) No 1907/2006 with amendments.

SECTION 16: OTHER INFORMATION

General information

The information contained in this safety data sheet is provided in accordance with the requirements of the regulations. The product should not be used for purposes other than those shown in section 1 without first referring to the supplier and obtaining written handling instruction. As the specific conditions of use of the product are outside the suppliers control, the user is responsible for ensuring that the requirements of relevant legislation are complied with.

Revision Comments

This information is provided in a revised format to that previously produced.

Revision Date: 01/01/2017

Revision: 01

Safety Data Sheet Status Approved.

Date printed 01/01/2017

Signature Initials P.K.

DISCLAMER:

If this product is re-distributed and re-formulated for sale, details of its hazards and recommended methods for safe handling must be passed to customers. Customers are urged to ensure that the product is entirely suitable for their own purpose. It is the customer's responsibility to ensure that a suitable and sufficient assessment of the risks created by a work activity using this product is undertaken before this product is used.

NOTE:

The information contained in this Safety Data Sheet does not constitute the users own assessment of workplace risk as required by other Health & Safety Legislation (e.g. the Health and Safety at Work Act,1974;the control of Substances Hazardous to Health Regulations,1988). The data given here is based on current knowledge and experience. The purpose of this data sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the product's properties.