1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Identifier

Chemical Name (EINECS): Boric Acid

Chemical Formula: H_3BO_3

Trade Names: Boric Acid

Synonyms: Boric Acid, Orthoboric acid, boracic acid

CAS Number: 10043-35-3

EINECS Number: 233-139-2

Index Number: 005-007-00-2

REACH Registration Number: 01-2119486683-25-XXXX

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

Identified use(s): Ceramics
Cosmetics
Detergents
Borosilicate glass
Insulation fibreglass

Company name: Nexchem Ltd
Unit 3 Barshaw Park
Leycroft Road
Leicester
LE4 1ET
Tel: 0116 2311130
24/7 Emergency Tel: 0800 246 1274
Email: sales@nexchem.co.uk

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Regulation 1272/2008 (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

[cont…]

EEC Directive 67/548/EEC & Directive 1999/45/EC:

Repr. Cat. 2; R60-R61

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

Risk Phrases: R60; R61

Safety Phrases: S45, S53

Label elements:

According to Regulation (EC) No. 1272/2008 (CLP).

Hazard Pictogram:

Signal word(s): Danger.

Hazard statement(s): H 360FD: May damage fertility or the unborn child.

Precautionary statement(s): 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.

According to REACH, Annex XVII: Restricted to professional users.

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 low acute toxicity. Small amounts (e.g., a teaspoonful) 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 minimised.

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 (see section 11).

[cont…]

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances: Boric Acid

CAS No.	EINECS No.	Registration No.	Purity	Risk Phrases (DSD)	Hazard Statement (CLP)
10043-35-3	233-139-2	01-2119486683-25-XXXX	99,9 %	R60 ; R61	H 360FD

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

4. FIRST AID MEASURES

Description of first aid measures:

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

Skin contact: No treatment necessary because non-irritating.

Eye contact: Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, 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.

Most import symptoms and effects, both acute and delayed:

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).

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable extinguishing media: Any fire extinguishing media may be used on nearby fires.

Special hazards arising from the substance or mixture:

None. Boric acid is not flammable, combustible or explosive.
The product is itself a flame retardant.

Advice for fire-fighters: NA

6. ACCIDENTAL RELEASE MEASURES

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.

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).

[cont…]

Methods and material 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).

Reference to other sections: For personal protection see Section 8& 13

7. HANDLING AND STORAGE

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. Your supplier can advise you on safe handling, please contact the supplier.

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.

Specific end use(s): The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances.
See exposure scenario in Annex to the MSDS.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

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: IFA Institut für Arbeitsshutz der Deutschen Gesetzlichen Unfallversicherung

Remarks:

Germany (AGS): (1) 15 minutes average value

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

[cont…]

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

DNEL values:

Exposure pattern	Type/site of effect	Exposure route	DNEL value
DNELs for workers			
Long-term	Systemic	Inhalation	8.3 mg BA/m3
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/m3
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

Exposure controls:

Appropriate engineering controls: No data available.

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

Environmental exposure controls: No special requirement.

[cont…]

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Physical State:	Crystalline solid
Colour:	White
Odour:	Odourless
Odour threshold:	NA
pH in water solution @20°C:	6.1 (0.1% solution) 5.1 (1.0% solution) 3.7 (4.7% solution)
Melting point/freezing point:	450 ±2°C (heated in closed space)
Initial Boiling point/boiling range:	1860°C
Flash point:	Non-flammable
Evaporation rate:	N.A.
Flammability (solid, gas):	N.A.
Upper/lower flammability or explosive limits:	N.A.
Vapour pressure:	Negligible @ 20°C
Vapour density:	N.A
Relative density:	1.51 @ 20°C
Solubility in water:	4.7% @ 20°C; 27.5% @ 100°C
Partition coefficient: n-octanol:	No Data Available
Auto-ignition temperature/water:	N.A.
Decomposition temperature:	169±1 toHBO2 & -1 ½ H2O at 300°C
Viscosity:	N.A.
Explosive properties:	Nonexplosive
Oxidising properties:	NA
Molecular weight:	61.83
Specific gravity:	1.51 @ 20°C

10. STABILITY AND REACTIVITY

Reactivity: N.A.

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).

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.

Conditions to avoid: N.A.

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

Hazardous decomposition products: N.A

[cont…]

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects:

Acute Oral Toxicity: Low acute oral toxicity; LD50 in rats is 3,500 to 4,100mg/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/eye 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 tests. 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. 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.

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).

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.

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:

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, 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

[cont…]

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

Bio accumulative potential: Not significantly bioaccumulative.

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

Results of PBT and vPvB assessment: N.A.

Other adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

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.

14. TRANSPORT INFORMATION

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

15. REGULATORY INFORMATION

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).

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

[cont…]

Note: The regulatory information given above only indicates the principal regulations specifically Applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

List of abbreviation and acronyms used in this SDS:

MSDS : Material Safety Data Sheet.
Index No: 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.
REACH : Registration, Evaluation, Authorisation and Restrictions of Chemicals Regulation (EC) N°1907/2006.
DSD: Dangerous Substances Directive 67/548/EEC.
Repr. Cat. 1B: substance presumed human reproductive toxicant.
CLP: Classification Labelling Packaging Regulation: Regulation (EC) N°1272/2008.
1st ATP : 1st Adaptation to Technical and scientific Progress.
LD50: Median Lethal Dose.
LC50: Lethal Concentration, 50%.
N.A. Not Applicable.
DNEL: Derived No effect Level.
PNEC: Predicted No Effect Concentration.
CSR: Chemical Safety Report.
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.
PBT: Persistent, Bioaccumulative and Toxic substance.
vPvB: Very Persistent and Very Bioaccumulative.
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.

[cont…]

List of relevant R phrases, hazard statements, safety phrases and/or precautionary statements used in this SDS:

Risk Phrases: R60: May impair fertility.
R61: May cause harm to the unborn child.

Hazard Statements: H360 FD: May damage fertility or 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.

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.

Legal disclaimer: The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation. This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.