



Solubor® Flow

Section 1 Identification of the substance/mixture and of the Company/undertaking

- 1.1 **Product Identifier**
Product Name: Solubor Flow
Grades: Technical
Chemical family: Inorganic borates
- 1.2 **Relevant identified uses of the substance or mixture and uses advised against**
Identified Uses: Fertilisers
Uses advised against: None
- 1.3 **Details of the supplier of the SDS**
Company Name: **Borax Europe Limited**
Address: 6 St. James's Square
London, SW1Y 4AD
United Kingdom
- Telephone number:** +44 (0)20 7781 2000
- Email:** rtm.msds@riotinto.com
- 1.4 **Emergency telephone number:** +44 (0) 1235 239 670
Official advisory body telephone number: None

Section 2 Hazards identification

- 2.1 **Classification of the substance or mixture**
- Classification (CLP Regulation (EC) No 1272/2008):** Classified as toxic for reproduction (Repr. 2; H361d).
- Classification (Directive 67/548/EEC):** Not classified.
- Refer to Section 16 for the full text of Hazard Statements mentioned above.

- 2.2 **Label Elements**
Labelling according to Regulation (EC) No 1272/2008 (CLP)

Hazard Pictograms



Signal word: Warning

Hazard statements:

H361d: Suspected of damaging the unborn child.

Precautionary statements:

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.

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

2.3 Other Hazards

H303: May be harmful if swallowed.

Section 3 **Composition/information on ingredients**

3.2 Mixture

Chemical Name	EC#	CAS#	% content	REACH Registration Number	Classification (1272/2008/EC)	Classification (67/548/EEC)
Sodium pentaborate	234-522-7	12631-71-9	>54.0	01-2119970731-35-0000	Repr. 2; H361d	Not classified

Refer to Section 16 for the full text of Hazard statements mentioned above.

Section 4 **First aid measures**

4.1 Description of First aid measures

Protection of first-aiders: No special protective clothing is required.

Inhalation: Does not readily evaporate or become suspended in air and is thus not expected to be inhaled. If symptoms such as nose or throat irritation are observed, remove to fresh air.

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

Skin contact: No treatment necessary.

Ingestion: Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

4.2 Most important symptoms and effects both acute and delayed: Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin. These may include nausea, vomiting, and diarrhoea, with delayed effects of skin redness and peeling (see Section 11).

4.3 Indication of any immediate medical attention and special treatment needed: Note to physicians: Supportive care only is required for adult ingestion of less than a few grams of the product. For ingestion of larger amounts, maintain fluid and electrolyte balance and maintain adequate kidney function. Gastric lavage is only recommended for heavily exposed, symptomatic patients in whom emesis has not emptied the stomach. Hemodialysis should be reserved for patients with massive acute absorption, especially for patients with compromised renal function. Boron analyses of urine or blood are only useful for verifying exposure and are not useful for evaluating severity of poisoning or as a guide in treatment¹.

Section 5 **Fire-fighting measures**

5.1 Extinguishing media

Suitable extinguishing media: Use extinguishing media that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media: None

5.2 Special hazards arising from substance or mixture

None. The product is not flammable, combustible or explosive.

- 5.3 Advice for fire fighters**
Not applicable. The product is itself a flame retardant.

Section 6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:

Eye goggles are not required for normal industrial exposures, but eye protection according to CEN166:1996, respirators according to CEN149:2001 should be considered.

For emergency responders:

Eye goggles are not required for normal industrial exposures, but eye protection according to CEN166:1996, respirators according to CEN149:2001 should be considered.

- 6.2 Environmental precautions:** The product is an aqueous suspension that may cause damage to trees or vegetation by root absorption. Avoid contamination of water bodies during clean up and disposal. 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 or meets local water quality standards.

6.3 Methods and material for containment and cleaning up

Appropriate containment: Avoid spillage into water and cover drains.

Land spill: Vacuum, shovel or sweep up and place in containers for disposal in accordance with applicable local regulations.

Spillage into water: Where possible, remove any intact containers from the water.

- 6.4 Reference to other sections**
Refer to sections 8, 12 and 13.

Section 7 Handling and storage

7.1 Precautions for safe handling

Good housekeeping procedures should be followed. Avoid spills.
Do not eat, drink and smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

No special handling precautions are required, but dry, indoor storage is recommended.

Storage temperature: Ambient
Storage pressure: Atmospheric
Special sensitivity: None

7.3 Specific end use(s)

Refer to Annex – Exposure Scenarios

Section 8 Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values:

There is no OEL for sodium pentaborate (CAS 12631-71-9).

DNELs

Sodium pentaborate (CAS 12631-71-9)

Route of exposure	Workers				Consumers			
	Acute effects	Acute effects	Chronic effects	Chronic effects	Acute effects	Acute effects	Chronic effects	Chronic effects

	local	systemic	local	systemic	local	systemic	local	systemic
Oral	Not Required				*	0.93 mg/kg/day	*	0.93 mg/kg/day
Inhalation	*	*	*	7.91 mg/m ³	*	*	*	3.98 mg/m ³
Dermal	*	*	*	371.2 mg/kg/day	*	*	*	187.2 mg/kg/day

* No hazard identified

Monitoring procedure: *BS EN 14042:2003 Title identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.*

PNECs

Compartment (Environment)	PNEC (added values)
Water, fresh and marine	2.02 mg B/L
Water, intermittent	13.7 mg B/L
Air	No exposure expected
Soil	5.4 mg B/kg dry soil
Sediment	Waived due to lack of partitioning to sediment
STP	10 mg B/L

8.2

Exposure controls

Appropriate engineering controls: Maintain sealed containers to prevent spills.

Personal protection equipment:

Eye and face protection: Eye protection according to CEN166:1996 may be warranted when transferring from one container to another.

Skin protection: Standard work gloves (rubber, nitrile, or butyl) may be warranted if excessive exposure to the skin is expected.

Respiratory protection: Where airborne concentrations are expected to exceed exposure limits, respirators should be used (CEN149:2001).

Environmental exposure controls:

Limiting releases from site: Where appropriate, material should be recovered and recycled through the process. Spillages should be vacuumed up immediately and placed in containers for disposal in order to prevent unintentional release to the environment. Waste containing borates should be handled as a hazardous waste and removed by licensed operator to an offsite location where it can be incinerated or disposed to a hazardous landfill.

Water Emissions: Storage should be sheltered from precipitation. Avoid spillage into water and cover drains. Removal from water can only be accomplished by very specific treatment technologies including ion exchange resins, reverse osmosis etc. Removal efficiency is dependent upon a number of factors and will vary from 40 to 90%. Much of the technology is currently not appropriate to high volume or mixed waste streams. Boron is not removed in considerable amounts in conventional STP. If sites discharge to a municipal STP the concentration of boron should not exceed the PNEC in the municipal STP.

Air Emissions: Emissions to air can be removed by one or more of the following dust-control measures: electrostatic precipitators, cyclones, fabric or bag filters, membrane filters, ceramic and metal mesh filters, and wet scrubbers.

Section 9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	White suspension
Odour	Odourless
Odour threshold:	Not applicable: odourless
pH @ 20°C:	7.0 – 8.0 (slurry)
Melting point/ Freezing point:	-3°C
Initial boiling point and boiling range:	100 – 110°C
Flash point:	Not applicable: inorganic substance
Evaporation rate:	Not applicable: non-volatile
Flammability (solid/liquid):	Non-flammable (used as a flame retardant)
Upper/lower flammability or explosive limits:	Not applicable: non-flammable
Vapour pressure:	Negligible @ 20°C
Vapour density:	Not measured
Relative density:	1.3 g/cc
Solubility(ies):	freely soluble

Partition coefficient; n-octanol/water:	Not applicable: inorganic substance
Auto-ignition temperature:	Not applicable: not self-heating
Decomposition temperature:	Not measured
Viscosity:	Not measured
Explosive properties:	Not explosive: does not contain chemical groups associated with explosive properties
Oxidising properties:	Not oxidising: does not contain chemical groups associated with oxidising properties
9.2 Other information	None

Section 10 Stability and reactivity

- 10.1 Reactivity:** None known.
- 10.2 Chemical stability:** Under normal ambient temperatures (-40 °C to +40 °C), the product is stable.
- 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:** Avoid contact with strong reducing agents by storing according to good industrial practice.
- 10.5 Incompatible materials:** Strong reducing agents.
- 10.6 Hazardous decomposition products:** None.

Section 11 Toxicological Information

11.1 Information on toxicological effects

(a) Acute toxicity:

Method: Acute Oral Toxicity Study – U.S. EPA FIFRA Guidelines

Species: Rat

Dose: 3 200 – 3 400 mg/kg body weight for disodium tetraborate pentaborate

Routes of Exposure: Oral

Results: LD₅₀ in rats is > 2,000 mg /kg body weight males for disodium tetraborate pentahydrate. Based on the available data, the classification criteria are not met

Method: Acute Dermal Toxicity Study – U.S. EPA FIFRA Guidelines

Species: Rabbit

Dose: 2,000 mg/kg bw boric acid

Routes of Exposure: Dermal

Results: No data on the product itself. Based on a dermal LD₅₀ value with boric acid in rabbits greater than 2000 mg/kg bw, and since Sodium Pentaborate is not anticipated to have a dermal LD₅₀ value in the range of 2000 – 5000 mg/kg bodyweight, the classification criteria are not met.

Method: Acute Inhalation Toxicity Study – OECD Guideline 403

Species: Rat

Dose: 2.12 mg/L disodium tetraborate pentahydrate

Routes of Exposure: Inhalation

Results: Based on LC₅₀ values in rats for acute inhalation toxicity studies with other borates that were > 2 g /m³, the classification criteria are not met.

(b) Skin corrosion / irritation:

Method: Primary Dermal Irritation Study – U.S. EPA FIFRA Guidelines

Species: New Zealand White Rabbit

Dose: 0.5 g disodium tetraborate pentahydrate moistened with saline

Routes of Exposure: Dermal

Results: No data on the product itself. Based on the lack of dermal irritation responses in the rabbit from dermal application of disodium tetraborate pentahydrate, the classification criteria are not met.

(c) Serious eye damage / irritation:

Method: Eye Irritation Study – OECD Guideline 405

Species: New Zealand White Rabbit

Dose: 0.1 g sodium pentaborate

Routes of Exposure: Eye

Results: Not irritating. Based on mean scores < 1, and the effects were fully reversible within 72 hours, the classification criteria are not met. Many years of occupational exposure indicate no adverse effects on human eye.

(d) Respiratory or skin sensitisation:

Method: Buehler Test - OECD Guideline 406

Species: Guinea Pig

Dose: 0.4 g disodium tetraborate pentahydrate

Routes of Exposure: Dermal

Results: No data on the product itself. There are no data to suggest that disodium tetraborates or sodium pentaborates are skin or respiratory sensitisers. Based on the available data, the classification criteria are not met.

(e) Germ cell mutagenicity:

Method: No germ cell mutagenicity studies with the product have been conducted. Several in vitro mutagenicity studies have been carried out on boric acid including gene mutation in mammalian cells, unscheduled DNA synthesis, chromosomal aberration and sister chromatid exchange in mammalian cells.

Species: L5178Y mouse lymphoma, V79 Chinese hamster cells, C3H/10T1/2 cells, hepatocytes, Chinese hamster ovary (CHO cells).

Dose: 1.0 - 10.0 mg/ml (1000 -10000 ppm) boric acid

Routes of Exposure: in vitro

Results: Not mutagenic (based on boric acid). Based on the available data, the classification criteria are not met.

(f) Carcinogenicity:

Method: OECD 451 equivalent.

Species: B6C3F1 mice

Dose: 446; 1150 mg boric acid/kg bw/day

Routes of Exposure: Oral feeding study

Results: No evidence of carcinogenicity (based on boric acid). Based on the available data, the classification criteria are not met.

(g) Reproductive toxicity:

Method: Three-generation feeding study - Similar to OECD 416 Two-Generation Study

Species: Rat

Dose: 0; 34 (5.9); 100 (17.5); and 336 (58.5) mg boric acid (mg B)/kg bw/day; and 0; 50 (5.9); 155 (17.5); and 518 (58.5) mg borax (mg B)/kg bw/day

Routes of Exposure: Oral feeding study

Results: NOAEL in rats for effects on fertility in males is 100 mg boric acid /kg bw and 155 mg sodium tetraborate decahydrate/kg bw; equivalent to 17.5 mg B/kg bw.

Method: Prenatal Developmental Toxicity Study - OECD Guideline 414

Species: Rat

Dose: 0; 19 (3.3); 36 (6.3); 55 (9.6); 76 (13.3); and 143 (25) mg boric acid (mg B)/kg bw.

Routes of Exposure: Oral feeding study

Results: NOAEL in rats for developmental effects on the foetus including foetal weight loss and minor skeletal variations is 55 mg boric acid/kg bw or 9.6 mg B/kg; equivalent to 64.7 mg disodium tetraborate pentahydrate/kg bw.

Reproductive Toxicity Category 2 (Hazard statement: H361d: Suspected of damaging fertility or the unborn child.)

Method: Occupational studies of evaluating sensitive sperm parameters in highly exposed borate workers. Epidemiological studies evaluating high environmental exposures to boron and developmental effects in humans have been conducted.

Species: Human

Dose: A subset of workers was exposed to 125 mg B/day.

Routes of Exposure: Combined oral ingestion and inhalation

Results: No adverse fertility effects in male workers. Epidemiological studies of human developmental effects have shown an absence of effects in exposed borate workers and populations living in areas with high environmental levels of boron.

Summary of evaluation of the CMR properties

Boric acid is not mutagenic and has been tested in 2 year bioassays to be negative for carcinogenicity. Accordingly a classification for these endpoints for disodium tetraborates is not required under EC Directive 67/548/EEC or under CLP Regulation (EC) No. 1272/2008. A multigeneration study in the rat gave a NOAEL for fertility in males of 17.5 mg B/kg/day. Developmental effects have been observed in laboratory animals, the most sensitive species being the rat with a NOAEL of 9.6 mg B/kg bw/day. Disodium tetraborate is classified under the 1st ATP to CLP as Repr. 1B; H360FD. While boron has been shown to adversely affect male reproduction in laboratory animals, there was no clear evidence of male reproductive effects attributable to boron in studies of highly exposed workers. Based on weight of evidence evaluation, classification as

Repr. Cat. 2 is justified.

(h) STOT-single exposure: No target organ has been identified in humans.

(i) STOT-repeated exposure:

Method: Chronic toxicity study of boric acid and disodium tetraborate decahydrate, similar to OECD 452

Species: Rat

Dose: 0; 33 (5.9); 100 (17.5); 334 (58.5) mg boric acid (B)/kg bw per day (nominal in diet); and 0; 52 (5.9); 155 (17.5); 516 (58.5) mg borax (B)/kg/day (nominal in diet)

Routes of Exposure: Oral feeding study

Results: A NOAEL of 17.5 mg B/kg bw/day was determined in a chronic feeding study (2 years) in rats and is based on testes effects. Other effects (kidney, haemopoietic system) are regarded only at even higher dose levels. Based on the available data, the classification criteria are not met.

(j) Aspiration hazard: Physical form of solid powder indicates no aspiration hazard potential.

Toxicokinetics

In the blood boric acid is the main species present and is not further metabolised. Boric acid is distributed rapidly and evenly through the body, with concentrations in bone 2 - 3 higher than in other tissues. Boric acid is excreted rapidly, with elimination half-lives of 1 h in the mouse, 3 h in the rat and < 27.8 h in humans, and has low potential for accumulation. Boric acid is mainly excreted in the urine. Absorption of borates via the oral route is nearly 100 %. For the inhalation route also 100 % absorption is assumed as worst case scenario. Dermal absorption through intact skin is very low with a percent dose absorbed of < 0.5 %.

Information on likely routes of exposure:

Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because product is poorly absorbed through intact skin. Product is *not* intended for ingestion.

Symptoms related to the physical, and chemical and toxicological characteristics:

At high concentrations irritation of nose, throat and eye may be observed. Products are *not* intended for ingestion. Small amounts (e.g. a teaspoonful) swallowed accidentally are not likely to cause effects. Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin. These may include nausea, vomiting, and diarrhoea, with delayed effects of skin redness and peeling.

Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid and sodium borate dust. Human epidemiological studies indicate no effect on fertility in occupational populations with chronic exposures to borate dust and indicate no effect to a general population with high exposures to borates in the environment.

Section 12 Ecological information

12.1 Toxicity

Note that the data values are expressed as boron equivalents. Studies judged to be unreliable or with insufficient information to evaluate are not included.

Freshwater

Chronic studies

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	References
Algal	4	10 mg B/L (<i>Chlorella pyrenoidosa</i>) to 50 mg B/L (<i>Anacystis nidulans</i>)	3, 4
Higher plants	3	4.0 mg B/L (<i>Phragmites australis</i>) to 60 mg B/L (<i>Lemna minor</i>)	5, 6
Invertebrate and protozoan	7	5.7 mg B/L (<i>Daphnia magna</i>) to 32 mg B/L (<i>Chironomus riparius</i>)	7, 8
Fish	6	2.9 mg B/L (<i>Micropterus salmoides</i>) to 17 mg B/L (<i>Carassius auratus</i>)	9
Amphibian	2	29 mg B/L (<i>Rana pipiens</i>) to 41 mg B/L (<i>Bufo fowleri</i>)	9

Results²: Based on the complete data set of 22 species, the HC₅ value of the species sensitivity distribution is 4.05 mg B/L.

Acute studies

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric EC/LC50)	References
Algal	2	10 mg B/L (<i>Chlorella pyrenoidosa</i>) to 28 mg B/L (<i>Selenastrum capricornutum</i>)	3, 10
Invertebrate and protozoan	9	113 mg B/L (<i>Ceriodaphnia dubia</i>) to 1376 mg B/L (<i>Chironomus decorus</i>)	11, 12
Fish	7	80 mg B/L (<i>Pimephales promelas</i>) to 627 mg B/L (<i>Onchorhynchus tshawytscha</i>)	11, 13
Amphibian	2	86 mg B/L (<i>Rana pipiens</i>) to 104 mg B/L (<i>Bufo fowleri</i>)	9

Results²: Based on the complete data set from 46 studies with 20 species, the HC₅ value of the species sensitivity distribution is 27.3 mg B/L

Classification: Based on the acute data for freshwater species, this substance is not classified as hazardous to the environment.

Marine and Estuarine Data

Chronic studies

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	References
Algal	19	5 mg B/L (<i>Emiliana huxleyi</i>) to >100 mg B/L (<i>Agmenellum quadruplicatum</i> , <i>Anacystis marina</i> , <i>Thalassiosira pseudonana</i>)	4

Results: No data are available for invertebrate or vertebrate species. The results from the freshwater data set are recommended as applicable to marine and estuarine species.

Acute studies

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric EC/LC50)	References
Invertebrate	3	45 mg B/L (<i>Litopenaeus vannamei</i>) to 83 mg B/L (<i>Americamysis bahia</i>)	14, 15
Fish	2	74 mg B/L (<i>Limanda limanda</i>) to 600 mg B/L (<i>Oncorhynchus tshawytscha</i>)	13, 16

No data are available for algal species.

Sediment

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric EC/LC50)	References
Invertebrate	1	82.4 mg B/kg sediment dw (<i>Chironomus riparius</i>)	17, 18

Results: Although limited, the data suggest that sediment organisms are within range of toxicity of aquatic organisms. In addition, the substance will not partition to the sediment, so a sediment/water partitioning approach is justified.

Sewage Treatment Plants (STP)

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	References
Activated sludge	NA	>17.5 mg B/L to 100 mg B/L	19
Microbes	3	10 mg B/L (<i>Opercularia bimarginata</i>) to 20 mg B/L (<i>Paramecium caudatum</i>)	20

Terrestrial Data

Chronic studies

Taxonomic Group	Number of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	References
Plant	28	7.2 mg B/kg dw (<i>Zea mays</i>) to 56 mg B/kg dw (<i>Allium cepa</i>)	21, 22
Invertebrates	9	15.4 mg B/kg dw (<i>Folsomia candida</i>) to 87 mg B/kg dw (<i>Caenorhabditis elegans</i>)	23, 24
Soil micro	3	12 mg B/kg dw (nitrogen mineralization and nitrification test) to 420 mg B/kg dw (soil nitrogen transformation test)	25, 26

Results²: Based on the complete data set, the HC₅ value of the species sensitivity distribution is 10.8 mg B/kg dw.

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants. 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.

12.2 Persistence and Degradability

Biodegradation is not an applicable endpoint since the product is an inorganic substance.

12.3 Bioaccumulative potential

This product will undergo hydrolysis in water to form undissociated boric acid. Boric acid will not biomagnify through the foodchain. Octanol/Water partition coefficient: Log P_{ow} = -0.7570 @ 25°C (based on boric acid).

12.4 Mobility in soil

The product is soluble in water and is leachable through normal soil. Adsorption to soils or sediments is insignificant.

12.5 Results of PBT and vPvB assessment

According to Annex XIII of REACH, criteria for the assessment of PBT and vPvB properties do not apply to inorganic substances.

12.6 Other adverse effects

None

Section 13 Disposal considerations**13.1 Waste treatment methods**

This product is classified as toxic to reproduction (Repr. 2) and falls within scope of Directive 2008/98/EC as hazardous waste (H10). Dispose via a licensed waste disposal contractor.
Product packaging should be recycled where possible.
Local authorities should be consulted about any specific local requirements.

Such product should, if possible, be used for an appropriate application.

Section 14 Transport information

Transport Classification for Road (ADR) / Rail (RID); Inland waterways (ADN); Sea (IMDG); Air (ICAO/IATA)

14.1 UN Number:	Not Regulated
14.2 UN Proper Shipping Name:	Not Regulated
14.3 Transport hazard class(es):	Not Regulated
14.4 Packing Group:	Not Regulated
14.5 Environmental Hazards	Not Regulated
14.6 Special precautions for user:	Not Regulated
14.7 Transport in bulk according to Annex II of Marpol 73/78 and the IBC code:	Not Regulated

Section 15 Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Regulation (EC) No 2037/2000 - Substances that deplete the ozone layer: Not manufactured with and does not contain any Group I or Group II ozone depleting substances.

Clean Air Act (Montreal Protocol) - Substances that deplete the ozone layer: Not manufactured with and does not contain any Class I or Class II ozone depleting substances.

Regulation (EC) No 689/2008 - Export and Import of Dangerous Chemicals: Not listed.

National Regulations: Ensure all national/local regulations are observed.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for sodium pentaborate.

Section 16 Other information

Revision Details:

Section 1: Supplier address; Emergency telephone number.

Abbreviations and acronyms:

ATP: Adaption to Technical Progress
 CLP: Classification, Labelling and Packaging Regulation (EC) No. 1272/2008
 CMR: Carcinogen, Mutagen, Reproductive Toxin
 EC: Effect concentration
 HC: Hazard Concentration
 LC: Lethal Concentration
 LD: Lethal Dose
 STOT: Specific Target Organ Toxicity
 DNEL: Derived No Effect Level
 LOEC: Lowest Observed Effect Concentration
 NA: Not applicable.
 NOAEL: No observed adverse effect level
 NOEC: No Observed Effect Concentration
 PNEC: Predicted No Effect Concentration
 PBT: Persistent, Bioaccumulative and Toxic
 vPvB: very Persistent, very Bioaccumulative
 TWA: Time Weighted Average
 STEL: Short-term exposure limit
 STP: Sewage Treatment Plant

References:

- 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
- Chemical Safety Report "Pentaboron sodium octaoxide" May 2013, <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>
- Fernandez et al. (1984) Phytol (Buenos Aires) 44: 125-133.
- Antia and Cheng (1975) J Fish Res Bd Can 32: 2487-2494.
- Bergman, Bruchlos, Marks (1995) Tenside Surf Det 32: 229-237.
- Wang (1986) Environ Poll (Ser B) 11: 1-14.
- Gersich and Milazzo (1990) Arch. Environ. Contam. Toxicol. 19: 72-76.
- Hooftman, van Dongelen-Sevenhuijsen and de Haan (2000). Unpublished report no. V99.1146 to Borax Europe Limited.
- Dyer (2001) Chemosphere 44: 369-376.
- Hansveit and Oldersma (2000) Unpublished report no: V99-157 to Borax Europe Limited.
- Soucek, Dickinson, Major (2010) Unpublished report to REACH Consortium for Borates.
- Maier and Knight (1991) Arch. Environ. Contam. Toxicol. 20, 282 – 287.
- Hamilton and Buhl (1990) Arch. Environ. Contam. Toxicol. 19, 366-373.
- Li, et al. (2007) Aquaculture 278, 175-178.
- Pillard et al. (2002) Environ Toxicol Chem, 21, 2131-2137.
- Taylor et al. (1985) Aquat Toxicol, 7, 135-144.
- Gerke, A (2011a). Unpublished report to REACH Consortium for Borates.
- Gerke, A (2011b). Unpublished report to REACH Consortium for Borates.
- Hansveit and Schoonmade (2000). Unpublished report no.: V99.156 to Borax Europe Limited.
- Guhl (2000) SÖFW-Journal 126: 17-24.
- Hosseini et al. (2007) J Plant Nutrition, 30, 773-781.
- Aquaterra Environmental (1998) Unpublished report to Environment Canada, Environmental Technology Centre.
- Becker-van Slooten, Campiche, Tarradellas (2003). Unpublished report to Environment Canada, Environmental Technology Centre.
- Moser and Becker (2009) Unpublished report to REACH Consortium for Borates.
- Van Laer, Salaets, Smolders (2010) Unpublished report to REACH Consortium for Borates.

26. Förster and Becker (2009) Unpublished report to REACH Consortium for Borates.
27. Cordia et al. (2003) Unpublished report no: PML 2002-C42r to Borax Europe, Ltd.

For general information on the toxicology of borates see Patty's Toxicology, 6th Edition Vol. I, (2012) Chap. 23, 'Boron'

Full text of Hazard statements mentioned in sections 2 and 3:

H361d: Suspected of damaging the unborn child.

Precautionary statements:

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.

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

Precautionary Phrases:

Do not ingest.

Keep out of reach of children.

Refer to safety data sheet.

Not for use in food, drugs or pesticides.

Disclaimer:

Borax Europe Limited provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgement in determining its appropriateness for a particular purpose.

BORAX EUROPE LIMITED MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY BORAX EUROPE LIMITED WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OR RELIANCE UPON THIS INFORMATION.

Annex

Exposure Scenarios

The following table lists the uses identified and registered for this substance. Each use has a number of applicable human health, environmental and consumer exposure scenarios. These can be found at www.borax.com/EU-REACH/exposure-scenarios

IU number	Sector	Identified Use	Life cycle stage					Sector of use category (SU)	Chemical Product Category (PC)	Process category (PROC)	Article category (AC)	Environmental release category (ERC)	Exposure Scenario	
			Manufacture	Formulation	End use	Consumer use	Service life (for articles)						Environment	Human Health
9	Agriculture	Formulation of borates in fertilizers		X				1, 3	12	2, 3, 4, 5, 8b, 9, 14	-	2	E4 - Generic formulation of borates into mixtures	<p>ES7 - Discharging bags (25 -50 kg) into mixing vessels</p> <p>ES8 - Discharging big bags (750 – 1500kg) into mixing vessels</p> <p>ES16 - Closed production at ambient temperatures</p> <p>ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities</p> <p>ES21 - General maintenance activities</p> <p>ES22 - Transfer of substances into small containers</p> <p>ES31 - Compaction and tableting of borate-containing powders</p> <p>ES32 - Working in a laboratory</p>
10	Agriculture	Professional use of fertilizers			X			1, 22	12	2, 3, 4, 5, 8a, 8b, 9, 11, 13	-	8a, 8c, 8d, 8f	E24 - Wide dispersive use of fertilizers containing borates	<p>ES5 - Fertigation using boron-containing liquid fertiliser</p> <p>ES10 - Transfer of boron-containing granular fertiliser</p> <p>ES23 - Transfer of boron-containing liquid foliar fertiliser</p> <p>ES27 - Spreading of boron-containing granular fertiliser</p> <p>ES28 - Application of boron-containing liquid foliar fertiliser</p>
11	Agriculture	Consumer use of fertilizers				X		21	19	-	-	8a, 8c, 8d, 8f	E24 - Wide dispersive use of fertilizers containing borates	ESC3 - Consumer use of boron-containing fertiliser

Note: The IU number as well as the Exposure Scenarios numbering is correct. Even if the numbering might be inconsistent in some cases, this is not a mistake. There are no documents missing.