

SAFETY DATA SHEET



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

1.1 Product identifier

Product name : Ammonium Pentaborate

Chemical name : Ammonium Pentaborate

EC number : 234-521-1

REACH Registration number

Registration number	Legal entity
01-2119970312-43-0001	Borax Français S.A.S.

CAS number : 12046-04-7

Product type : Solid.

Other means of identification : Ammonium Pentaborate

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

Material uses : Refer to the table "Identified uses" below.

Identified uses
Importing and packaging Coatings (Flame retardants) <i>A complete list of uses is provided in the introduction to Annex - Exposure Scenarios</i>

Uses advised against	Reason
Consumer uses above a concentration of 0.3%.	-

1.3 Details of the supplier of the safety data sheet

Borax Europe Limited

6 St. James's Square
London, SW1Y 4AD
United Kingdom
T: +44 (0)20 7781 2000

Borax Francais S.A.S.

Usine/Siège Social
Route de Bourbourg
59411 Coudekerque-Branche
Cedex, France
T: +33 3 28 29 28 30

Rio Tinto Iron & Titanium GmbH

Alfred-Herrhausen-Allee 3-5,
65760 Eschborn
Germany
T: +49 6196 96000

e-mail address of person responsible for this SDS : rtb.sds@riotinto.com

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

1.4 Emergency telephone number

Telephone number : +44 (0) 1235 239 670 (Rio Tinto Borates)
For advice on chemical emergencies, spillages, fires or First Aid.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mono-constituent substance

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Repr. 2, H361d

Dipotassium tetraborate tetrahydrate has a specific concentration limit of $\geq 4.8\%$ for toxic to reproduction classification. The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : Suspected of damaging the unborn child.

Precautionary statements

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

Response : IF exposed or concerned: Get medical advice/attention.

Storage : Not applicable.

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

Hazardous ingredients : diammonium decaborate

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII :

PBT	P	B	T	vPvB	vP	vB
Not applicable (Inorganic)	N/A	N/A	N/A	Not applicable (Inorganic)	N/A	N/A

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SECTION 2: Hazards identification

Other hazards which do not result in classification : May be harmful if swallowed.

SECTION 3: Composition/information on ingredients

3.1 Substances : Mono-constituent substance

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
Ammonium Pentaborate	REACH #: 01-2119970312-43 EC: 234-521-1 CAS: 12046-04-7	>99	Repr. 2, H361d See Section 16 for the full text of the H statements declared above.	Repr. 2, H361d: C ≥ 4.8%	[1]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

[1] Constituent

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : Use eye wash fountain or fresh water to cleanse the eye. If irritation persists for more than 30 minutes, seek medical attention.
- Inhalation** : If symptoms such as nose or throat irritation are observed, remove to fresh air.
- 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.
- Protection of first-aiders** : No special protective clothing is required

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : 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.
- Ingestion** : 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.

4.3 Indication of any immediate medical attention and special treatment needed

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SECTION 4: First aid measures

- Notes to physician** : 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 treatment.
- Specific treatments** : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

5.2 Special hazards arising from the substance or mixture

- Hazards from the substance or mixture** : None. The product is not flammable, combustible or explosive. Ammonia gas may be released at high temperatures.
- Hazardous combustion products** : None.

5.3 Advice for firefighters

- Special protective actions for fire-fighters** : None.
- Special protective equipment for fire-fighters** : Not applicable.
- Additional information** : Not explosive.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : Eye goggles and gloves are not required for normal industrial exposures, but eye protection according to CEN 166:2001, Respirators (CEN 149:2001) should be considered if environment is excessively dusty.
- For emergency responders** : Eye goggles and gloves are not required for normal industrial exposures, but eye protection according to CEN 166:2001, Respirators (CEN 149:2001) should be considered if environment is excessively dusty.

6.2 Environmental precautions

- : The product is a water-soluble white powder 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

- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.

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SECTION 6: Accidental release measures

- Large spill** : Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.
- 6.4 Reference to other sections** : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

- Protective measures** : Good housekeeping procedures should be followed to minimise dust generation and accumulation. Avoid spills.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

No special handling precautions are required, but dry, indoor storage is recommended. To maintain package integrity and to minimise caking of the product, bags should be handled on a first-in first-out basis.

Storage temperature: Ambient temperature
Storage pressure: Ambient pressure
Special sensitivity: Moisture (Caking)

7.3 Specific end use(s)

- Recommendations** : Refer to Annex - Exposure Scenarios
- Industrial sector specific solutions** : Not available.

SECTION 8: Exposure controls/personal protection

The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

- Recommended monitoring procedures** : In the absence of a national OEL, Rio Tinto Borates recommends and applies internally an Occupational Exposure Limit (OEL) of 1 mg B/m³. To convert product into equivalent boron (B) content, multiply by 0.199

DNELs/DMELs

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SECTION 8: Exposure controls/personal protection

Product/ingredient name	Type	Exposure	Value	Population	Effects
Diammonium decaborate octahydrate	DNEL	Long term Oral	0.63 mg/kg bw/day	General population [Consumers]	Systemic
	DNEL	Short term Oral	0.63 mg/kg bw/day	General population [Consumers]	Systemic
	DNEL	Long term Dermal	127 mg/kg bw/day	General population [Consumers]	Systemic
	DNEL	Long term Dermal	252 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	17.04 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	7.1 mg/m ³	Workers	Local
	DNEL	Short term Inhalation	5.4 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	5.4 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	17.04 mg/m ³	General population [Consumers]	Local
	DNEL	Short term Inhalation	2.69 mg/m ³	General population [Consumers]	Systemic
	DNEL	Long term Inhalation	2.69 mg/m ³	General population [Consumers]	Systemic
	DNEL	Long term Inhalation	9.3 mg/m ³	General population [Consumers]	Local

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
Diammonium decaborate octahydrate	Fresh water	2.02 mg B/L	-
	Marine water	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	-
	Sewage Treatment Plant	10 mg B/L	-

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

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SECTION 8: Exposure controls/personal protection

- Eyeface protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. Eye protection according to CEN 166:2001 may be warranted if environment is excessively dusty
- Skin protection**
- Hand protection** : Standard work gloves (cotton, canvas or leather) may be warranted if environment is excessively dusty
- Body protection** : No special protective clothing is required.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Where airborne concentrations are expected to exceed exposure limits, respirators should be used. (CEN 149:2001).
- Environmental exposure controls** : Limiting releases from site: Where appropriate, material should be recovered and recycled through the process. Spillages of powder or granulated borates should be swept or 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

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

- Physical state** : Solid. [Crystalline solid.]
- Colour** : White.
- Odour** : Ammonia.
- Odour threshold** : Not available.
- Melting point/freezing point** : >500°C
- Initial boiling point and boiling range** : Not applicable. [melting point >300°C]
- Flammability** : Non-flammable. The product is not flammable, combustible or explosive.
- Lower and upper explosion limit** : Not applicable (solid).Not applicable. Non-flammable.
- Flash point** : Not applicable (solid).Not applicable. Inorganic substance.
- Auto-ignition temperature** : Not applicable (solid). [Not self-heating.]

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SECTION 9: Physical and chemical properties

Decomposition temperature	: Not applicable. Melting point>300 °C
pH	: 8.35 (1.0% solution); 7.32 (10.0% solution)
Viscosity	: Dynamic: Not applicable (not liquid). [solid substance] Kinematic: Not applicable (not liquid). [solid substance]
Solubility(ies)	: Not available.
Solubility in water	: 9.62 g/l
Partition coefficient: n-octanol/ water	: Not applicable. [Inorganic substance.]
Vapour pressure	: Not applicable (solid).Not applicable. Melting point>300 °C
Evaporation rate	: Not applicable (solid). [Non-volatile.]
Relative density	: 1.574
Density	: 1.574 g/cm ³
Bulk density	: Not available. Depends on batch.
Granulometry	: Not available. Depends on batch.
Vapour density	: Not applicable (solid).Not applicable. Melting point>300 °C
Explosive properties	: Not explosive.
Oxidising properties	: Not oxidising.
Particle characteristics	
Median particle size	: Not available.

SECTION 10: Stability and reactivity

10.1 Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: Under ambient temperatures, the product is stable. The product slowly breaks down to release ammonia.
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. Reaction with strong bases such as NaOH will generate ammonia (NH ₃)
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 and strong bases
10.6 Hazardous decomposition products	: Ammonia.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Product/ingredient name	Result type	Species	Dose	Exposure
Ammonium Pentaborate	LD50 Oral	Mouse	>4200 mg/kg body weight	-

Conclusion/Summary : Based on the available data, the classification criteria are not met.

Irritation/Corrosion

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SECTION 11: Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
Ammonium Pentaborate	Eyes - No irritation. Skin - No irritation.	Rabbit Rabbit	- -	0.1 g 0.5 grams applied to intact and abraded skin. Based on similar substance Ammonium Biborate	- -

Conclusion/Summary

- Skin** : Based on the lack of dermal irritation responses in the rabbit from dermal application of ammonium baborate, no dermal irritation would be expected from ammonium pentaborate.
- Eyes** : Slight initial reaction was observed subsiding after 30 minutes, Based on the results of the primary eye irritation study, the classification criteria are not met.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
boric acid	Respiratory skin	Guinea pig Guinea pig	Not sensitizing Not sensitizing

Conclusion/Summary

- Skin** : Non-sensitiser to skin. (based on boric acid)
- Respiratory** : No respiratory sensitisation studies have been conducted. Non-sensitiser. (based on boric acid)

Mutagenicity

Product/ingredient name	Test	Experiment	Result
boric acid	(based on boric acid)	Experiment: In vitro Subject: Mammalian-Animal Cell: Germ	Negative

- Conclusion/Summary** : No data available on the product itself. Not mutagenic (based on boric acid)

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
boric acid	Negative - Oral - TC	Mouse	446 to 1150 mg/kg Boric acid / body weight	

- Conclusion/Summary** : No data available on the product itself. No evidence of carcinogenicity (based on boric acid).

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility effects	Developmental effects	Species	Effects	Exposure
boric acid	- Negative	Positive Negative	- Negative	Rat Human	NOAEL in rats for effects on fertility in males is 17.5 mg B/kg body weight. 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. Epidemiological studies of human	Oral feeding study Combined oral ingestion and inhalation.

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	Positive	-	Positive	Rat	developmental effects have shown an absence of effects in exposed borate workers and populations living in areas with high environmental levels of boron. NOAEL in rats for developmental effects on the foetus including foetal weight loss and minor skeletal variations is 9.6 mg B/kg body weight; NOAEL in rats for maternal toxicity is 13.3 mg B/kg body weight	Oral feeding study
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Conclusion/Summary : Reprotoxicity studies have been conducted with boric acid and disodium tetraborate. 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. Boric acid and Disodium tetraborate are 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. Following an evaluation based on weight of evidence, classification as Repr. Cat 2 is justified

Teratogenicity

Conclusion/Summary : See Reproductive toxicity.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
No data available on the product itself.			

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
No data available on the product itself.			

Aspiration hazard

Product/ingredient name	Result
Diammonium decaborate octahydrate	Physical form of solid powder indicates no aspiration hazard potential.

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. **This product is not intended for ingestion.**

Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : 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.

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Ingestion : This product is not intended for ingestion. Small amounts (e.g., a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms. 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.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : 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.
Ingestion : 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

Short term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.
Potential delayed effects : 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.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
boric acid	Chronic NOAEL Oral	Rat	17.5 mg/kg 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)	Oral feeding study

Conclusion/Summary : A NOAEL of 17.5 mg B/kg body weight/day equivalent to 100 mg boric acid/kg body weight/day was determined in a chronic feeding study (2 years) in rats and is based on testes effects.

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.

General : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Reproductive toxicity : Suspected of damaging the unborn child.

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SECTION 11: Toxicological information

Toxicokinetics

- Absorption** : 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 %.
- Distribution** : Boric acid is distributed rapidly and evenly through the body, with concentrations in bone 2 - 3 higher than in other tissues.
- Metabolism** : In the blood boric acid is the main species present and is not further metabolised
- Elimination** : 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.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
boric acid	EC50 52.4 mg/l (as Boron)	<i>Pseudokirchneriella subcapitata</i>	Fresh water - Acute
	LC50 91 mg/l (as Boron)	<i>Ceriodaphnia dubia</i>	Fresh water - Acute
	LC50 79.7 mg/l (as Boron)	<i>Pimephales promelas</i>	Fresh water - Acute
	NOEC 6.4 mg/l (as Boron)	<i>Brachydanio rerio</i>	Fresh water - Chronic
	NOEC 14.2 mg/l (as Boron)	<i>Daphnia magna</i>	Fresh water - Chronic
	NOEC 17.5 mg/l (as Boron)	<i>Pseudokirchneriella subcapitata</i>	Fresh water - Chronic

Conclusion/Summary : Note that the data values are expressed as boron equivalents. To convert product into equivalent boron (B) content, multiply by 0.1986

Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in high quantities. Care should be taken to minimize the amount of this product released to the environment.

12.2 Persistence and degradability

Conclusion/Summary : Not applicable. Inorganic substance

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
boric acid	-0.757	-	low

12.4 Mobility in soil

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SECTION 12: Ecological information

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : 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

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
Diammonium decaborate octahydrate	Not applicable (Inorganic)	N/A	N/A	N/A	Not applicable (Inorganic)	N/A	N/A

12.6 Endocrine disrupting properties

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Hazardous waste : Yes. This product is classified as toxic to reproduction (Repr. 2) and falls within scope of Directive 2008/98/EC as hazardous waste (H10).

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : Care should be taken when handling emptied containers that have not been cleaned or rinsed out.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number or ID number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-

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SECTION 14: Transport information

14.5 Environmental hazards	No.	No.	No.	No.
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14.6 Special precautions for user : Not applicable.

14.7 Maritime transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Not listed

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

National regulations

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

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SECTION 15: Regulatory information

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	: All components are listed or exempted.
Canada	: All components are listed or exempted.
China	: All components are listed or exempted.
Eurasian Economic Union	: Russian Federation inventory : All components are listed or exempted.
Japan	: Japan inventory (CSCL) : All components are listed or exempted. Japan inventory (ISHL) : All components are listed or exempted.
New Zealand	: All components are listed or exempted.
Philippines	: All components are listed or exempted.
Republic of Korea	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
Thailand	: All components are listed or exempted.
Turkey	: Not determined.
United States	: All components are active or exempted.
Viet Nam	: All components are listed or exempted.

15.2 Chemical safety assessment : Not yet complete.

SECTION 16: Other information

📌 Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DMEL = Derived Minimal Effect Level
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 N/A = Not available
 PBT = Persistent, Bioaccumulative and Toxic
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number
 SGG = Segregation Group
 vPvB = Very Persistent and Very Bioaccumulative

Key literature references and sources for data : For general information on the toxicology of borates see Patty's Toxicology, 6th Edition Vol. I, (2012) Chap. 23, 'Boron'.

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Repr. 2, H361d	Expert judgment

Full text of abbreviated H statements

H361d	Suspected of damaging the unborn child.
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Full text of classifications [CLP/GHS]

Repr. 2	REPRODUCTIVE TOXICITY - Category 2
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Ammonium Pentaborate

SECTION 16: Other information

Additional information : Restricted to professional users.
Do not ingest.
Keep out of reach of children.
Refer to safety data sheet.
Not for use in food, drugs or biocides

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Notice to reader

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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

Exposure Scenario (ES)		Sector of Use (SU)	Article Category (AC)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Subsq Service Life
1	Manufacture of the substance	-	-	-	1, 2, 3 ,8b, 9, 14, 15, 28	1	-
2	Formulation into mixture	-	-	9a, 12	1, 2, 3, 8a, 8b, 9, 15, 28	2	-
3	Industrial use in electrolytic capacitors	16, 23	-	0: other	2, 3, 5, 8a, 8b, 9, 15, 28	5	ES7, ES9, ES10
4	Industrial use of varnish	19	-	9a	2, 7, 8a, 10, 13, 28	4	ES6, ES8
5	Professional use of micronutrient fertilisers	1	-	12	2, 3, 8a, 9, 11, 28	8a, 8d	-
6	Industrial service life of varnished articles	-	7a	-	21, 24	12a, 12c	-
7	Industrial service life of electronic articles	-	3	-	21	12c	-
8	Professional service life of varnished articles	-	7a	-	21, 24	10a, 11a	-
9	Professional service life of electronic articles	-	3	-	21	10a, 11a	-
10	Consumer service life of electronic articles	-	3	-	-	10a, 11a	-