SAFETY DATA SHEET

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

1.1 Product identifier

Product name : **Sodium metaborate 4 mol**

Chemical name : Sodium metaborate dihydrate

EC number : 231-891-6

REACH Registration number

Registration number	Legal entity
01-2119516444-44-0003	Borax Français S.A.S.

CAS number : 16800-11-6

Product type : Solid.

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
Chemical production Complexing agent Corrosion inhibitors and anti-scaling agents Flux agents for casting Laboratory chemicals Lubricants and lubricant additives Photosensitive agents and other photo-chemicals pH-regulating agents Plating agents and metal surface treating agents Process regulator (other than polymerisation or vulcanization processes) Processing aid not otherwise listed Surface active agents Viscosity modifiers *A complete list of uses is provided in the introduction to Annex - Exposure Scenarios*

1.3 Details of the supplier of the safety data sheet

Borax Europe Limited
6 St. James's Square
London, SW1Y 4AD
United Kingdom

+44 (0)20 7781 2000

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

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]

Eye Irrit. 2, H319
Repr. 2, H361d (Unborn child)

Sodium metaborate dihydrate has a specific concentration limit of ≥ 9.1% 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 : Causes serious eye irritation.
Suspected of damaging the unborn child.

Precautionary statements

Prevention : Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.

Response : IF exposed or concerned: Get medical attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : Sodium metaborate dihydrate

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

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII : Not applicable.

SECTION 2: Hazards identification

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII : Not applicable.

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	%	Regulation (EC) No. 1272/2008 [CLP]	Type
Sodium metaborate dihydrate	REACH #: 01-2119516444-44 EC: 231-891-6 CAS: 7775-19-1	>99	Eye Irrit. 2, H319 Repr. 2, H361d (Unborn child) **See Section 16 for the full text of the H statements declared above.**	[A]

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

[A] Constituent
[B] Impurity
[C] Stabilising additive

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 : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

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.

SECTION 4: First aid measures

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

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.

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 protection according to CEN 166:2001; respirators according to CEN149:2001 should be considered if environment is excessively dusty.

For emergency responders : Eye protection according to CEN 166:2001; respirators according to CEN149:2001 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.

SECTION 6: Accidental release measures

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.

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

8.1 Control parameters

Occupational exposure limits

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).

Product/ingredient name	Exposure limit values
Sodium metaborate dihydrate	**ACGIH TLV (United States, 3/2017).** TWA: 2 mg/m³ 8 hours. Form: Inhalable fraction STEL: 6 mg/m³ 15 minutes. Form: Inhalable fraction

SECTION 8: Exposure controls/personal protection

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/m^3. To convert product into equivalent boron (B) content, multiply by 0.1062.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Sodium metaborate dihydrate	DNEL	Short term Oral	1.6 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Oral	1.6 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	6.87 g/m³	Consumers	Systemic
	DNEL	Long term Dermal	323 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Dermal	640.3 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	13.7 mg/m³	Workers	Systemic

PNECs

Product/ingredient name	Compartment Detail	Value	Method Detail
Sodium metaborate dihydrate	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.

Eye/face 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: chemical splash goggles. Eye protection according to CEN 166:2001 is required.

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.

SECTION 8: Exposure controls/personal protection

Respiratory protection : 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 an 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

Physical state : Solid. [Crystalline solid.]

Colour : White.

Odour : Odourless.

Odour threshold : Not applicable.

pH : 10.6 (0.1% solution); 11.1 (1.0% solution); 11.5 (4.0% solution)

Melting point/freezing point : >500°C

Initial boiling point and boiling range : Not applicable.

Flash point : Not applicable.

Evaporation rate : Not applicable.

Flammability (solid, gas) : Non-flammable.

Upper/lower flammability or explosive limits : Not available.

Vapour pressure : Not applicable.

Vapour density : Not available.

Bulk density : Not available.

Granulometry : Not available.

Relative density : 1.9

Solubility(ies) : water: 31.0% @ 20°C; 81.1% @ 100°C

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not applicable.

Decomposition temperature : Not applicable.

Viscosity : Dynamic (room temperature): Not applicable.
Kinematic (room temperature): Not applicable.

Explosive properties : Not explosive.

SECTION 9: Physical and chemical properties

Oxidising properties : Not oxidising.

9.2 Other information

Solubility in water : 31 g/l

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 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 acids

10.5 Incompatible materials : Material is alkaline and can cause corrosion of metals such as aluminium, tin and zinc

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result type	Species	Dose	Exposure
Sodium metaborate dihydrate	LC50 Inhalation Dusts and mists LD50 Dermal LD50 Oral	Rat Rabbit Rat	>2 mg/l >2000 mg/kg body weight 3251 mg/kg body weight	4 days - -

Conclusion/Summary : No data available on the product itself. Based on available data, the classification criteria are not met.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Sodium metaborate dihydrate	Skin - No irritation. Eyes - Irritant	New Zealand White Rabbit New Zealand White Rabbit	- -	0.5 g moistened with saline 0.08 ml equivalent	- -

Conclusion/Summary

Skin : No data available on the product itself. Based on similar substance of sodium metaborate dehydrate no skin irritation would be expected. Based on the available data, the classification criteria are not met.

Eyes : No data available on the product itself. However, based on pH and alkaline reserve, the product is likely to be an eye irritant. EU Classification: Eye Irrit. 2 Causes serious eye irritation. Since a low alkaline reserve for sodium metaborates has been estimated, the sodium metaborates are not likely to be serious irritants.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
Sodium metaborate dihydrate	skin	Guinea pig	Not sensitizing

SECTION 11: Toxicological information

Conclusion/Summary

Skin : No respiratory sensitisation studies have been conducted. There are no data to suggest that borates are respiratory sensitisers. Based on the available data, the classification criteria are not met.

Respiratory : No respiratory sensitisation studies have been conducted. There are no data to suggest that borates are respiratory sensitisers. Based on available data, the classification criteria are not met.

Mutagenicity

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

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

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure
boric acid	Negative - Oral - TC	Mouse	446 to 1150 mg/kg bw /day (mg Boric acid / kg body weight / day)	Oral feeding study

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

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility effects	Developmental effects	Species	Effects	Exposure
Sodium metaborate dihydrate	-	Positive	-	Rat	NOAEL in rats for effects on fertility in males is 17.5 mg B/kg body weight.	Oral feeding study
	Positive	-	Positive	Rat	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
	Negative	Negative	Negative	Human	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 developmental effects have shown an absence of effects in exposed borate workers and populations living in areas with high environmental levels of boron.	Combined oral ingestion and inhalation.

SECTION 11: Toxicological information

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
Based on the available data, the classification criteria are not met.			

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Based on the available data, the classification criteria are not met.			

Aspiration hazard

Product/ingredient name	Result
Sodium metaborate dihydrate	Physical form of solid powder indicates no aspiration hazard potential.

Information on likely routes of exposure : Routes of entry anticipated: Inhalation.
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.**

Potential acute health effects

Eye contact : Causes serious eye irritation.

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 : 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 : Adverse symptoms may include the following:
pain or irritation
watering
redness

SECTION 11: Toxicological information

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing

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
Sodium metaborate dihydrate	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. Based on the available data, the classification criteria are not met.

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.

Teratogenicity : Suspected of damaging the unborn child.

Developmental effects : Suspected of damaging the unborn child.

Fertility effects : No known significant effects or critical hazards.

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.

SECTION 11: Toxicological information

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.

Other information : 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.**

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Test	Result	Species	Exposure
Sodium metaborate dihydrate	Algae	EC50 52.4 mg/l (as Boron)	*Pseudokirchneriella subcapitata*	Fresh water - Acute
	Invertebrate	LC50 91 mg/l (as Boron)	*Ceriodaphnia dubia*	Fresh water - Acute
	Fish.	LC50 79.7 mg/l (as Boron)	*Pimephales promelas*	Fresh water - Acute
	Fish.	NOEC 6.4 mg/l (as Boron)	*Brachydanio rerio*	Fresh water - Chronic
	Invertebrate	NOEC 14.2 mg/l (as Boron)	*Daphnia magna*	Fresh water - Chronic
	Algae	NOEC 17.5 mg/l (as Boron)	*Pseudokirchneriella subcapitata*	Fresh water - Chronic

Conclusion/Summary : Note that the data values are expressed as boron equivalents. To convert this product into equivalent boron (B) content, multiply by 0.1062. Studies judged to be unreliable or with insufficient information to evaluate are not included.

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

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

PBT : Not applicable.

vPvB : Not applicable.

12.6 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). Dispose via a licensed waste disposal contractor

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	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.

14.6 Special precautions for user : Not applicable.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code : 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.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

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.

Europe : All components are listed or exempted.

Japan : **Japan inventory (ENCS)**: All components are listed or exempted.
Japan inventory (ISHL): Not determined.

Malaysia : Not determined.

SECTION 15: Regulatory information

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 : Not determined.

Turkey : All components are listed or exempted.

United States : All components are listed or exempted.

Viet Nam : Not determined.

15.2 Chemical safety assessment : 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
IMSBC = International Maritime Solid Bulk Cargoes Code
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
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
Eye Irrit. 2, H319 Repr. 2, H361d (Unborn child)	Expert judgment Expert judgment

Full text of abbreviated H statements

H319 H361d	Causes serious eye irritation. Suspected of damaging the unborn child.

Full text of classifications [CLP/GHS]

Eye Irrit. 2, H319 Repr. 2, H361d	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 REPRODUCTIVE TOXICITY (Unborn child) - Category 2

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

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Notice to reader

SECTION 16: Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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
1	Production and Import	Production and Import	X					3,8,9	1,7,8,9a,9b,12,14,15, 17,18,19, 20,21,23, 24,25,26, 29,30,32, 37,38,39	1, 2, 3, 4, 8a, 8b, 9, 14, 15	-	1, 6a	E1 - Importing, manufacture, refining and packaging of borates	ES3 - Refining and processing of borates ES14 - Loading of road tankers ES19 - Packaging into bags (25-50kg) ES20 - Packaging into big bags (750-1500kg) ES21 - General maintenance activities ES32 - Working in a laboratory ES41 - Working in a warehouse
6	Adhesives	Formulation of borates in adhesives		X				6a, 6b, 9, 11	1	3, 4, 5, 8a, 8b, 9, 14	-	2	E7 - Formulation into of borates into adhesives	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES16 - Closed production at ambient temperatures ES18 - Transfer of substance or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES31 - Compaction and tabletting of borate-containing powders ES32 - Working in a laboratory
7	Adhesives	Industrial use of adhesives			X		X	3, 6a, 6b, 16, 17, 18, 19	1	2, 4, 5, 7, 8b, 9, 10, 13, 14	-	5	E12 - Industrial use of adhesives containing borate compounds	ES6 - Industrial application of adhesive ES18 - Transfer of substance or preparations from/to large vessels/containers at dedicated facilities ES26 - Professional application of adhesives
8	Adhesives	Consumer use of articles containing adhesives				X	X	21	-	-	8	10a, 11a	E27 - Generic wide dispersive use of articles containing borates with low release	ESC2 - Consumer mouthing of cardboard and oral contact with boron-containing adhesives

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
12	Analytical reagent	Formulation into analytical reagents		X				3	21	2, 3, 4, 5, 8b, 9, 15, 19	-	2	E4 - Generic formulation of borates into mixtures	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES16 - Closed production at ambient temperatures ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES32 - Working in a laboratory
13	Analytical reagent	Laboratory use of analytical reagent			X			3,22	21	15	-	8a, b, d, e	E22 - Generic environmental exposure scenario for use of borates in laboratories as analytical reagent	ES32 - Working in a laboratory
14	Autocausticing	Processing aid						3, 6b	20	8b, 9	-	4	E10 - Industrial use of borates for autocausticizing	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities

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
21	Chemical synthesis	Manufacture of new chemicals using borates	X					3, 8, 9	19	2, 3, 4, 5, 8b, 9, 13, 15, 19, 21	-	1, 6a	E2 - Generic industrial use of borates resulting in the manufacture of another substance	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES16 - Closed production at ambient temperatures ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES31 - Compaction and tabletting of borate-containing powders ES32 - Working in a laboratory
30	Detergents	Formulation into detergents		X				3, 10	35	2, 3, 4, 5, 8b, 9, 15	-	2	E5 - Formulation of borates into detergents	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES16 - Closed production activities at ambient temperatures ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES31 - Compaction and tabletting of borate-containing powders ES32 - Working in a laboratory
31	Detergents	Professional use of detergents			X			22	35	1, 2, 3, 11, 10, 13, 19	-	8a, 8c, 8d, 8f	E23 - Generic wide dispersive use of borates with 100% release to water	ES4 - Use of fabric detergents in industrial or professional settings

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
32	Detergents	Consumer use of detergents				X		21	35	-	-	8a, 8c, 8d, 8f	E23 - Generic wide dispersive use of borates with 100% release to water	ESC1 - Consumer use of boron-containing detergents
36	Industrial fluids	Formulation of borates into industrial fluids		X				3, 8, 9, 10,15	20, 24, 25	3, 4, 5, 8b, 9		2	E4 - Generic formulation of borates into mixtures	ES2 - Closed or largely closed production at high temperatures ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES16 - Closed production at ambient temperatures ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES32 - Working in a laboratory

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
37	Industrial fluids	Industrial use of industrial fluids		X	X			3, 15, 17	19, 20, 24, 25	1, 2, 6, 8a, 8b, 9, 10, 13, 16,17, 18, 19, 20 21, 22, 23, 24, 26	-	2, 4, 5, 7	E4 - Generic formulation of borates into mixtures E9 - Generic industrial use of borates as processing aids in processes and products E11 - Generic industrial use of borates resulting in inclusion into or onto a matrix E18 - Generic industrial use of borates in closed systems	ES2 - Closed or largely closed production at high temperatures ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES9 - Diluting metal working fluid concentrate with water ES12 - Use of cleaners in industrial or professional settings ES16 - Closed production at ambient temperatures ES17 - Make up of treatment baths for galvanising, plating and other surface treatments ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES29 - Galvanising, plating and other surface treatments of metal articles ES32 - Working in a laboratory ES33 - Use of metal working fluids in machining ES34 - Greasing at high energy conditions
38	Industrial fluids	Consumer use of automotive fluids				x		21	4, 16, 24	-	-	9a, 9b	E27 - Generic wide dispersive use of articles containing borates with low release	ESC8 - Consumer exposure for the use of automotive fluids

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
40	Metallurgy	Manufacture of flux mixtures and pastes	X	X				3, 10, 13	38	3, 4, 5, 8b, 9, 14	-	2	E4 - Generic formulation of borates into mixtures	ES2 - Closed or largely closed production at high temperatures ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES16 - Closed production activities at ambient temperatures ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES22 - Transfer of substances into small containers ES32 - Working in a laboratory
44	Metallurgy	Use of borates in metal treatment (plating, passivation, galvanising etc)			X			3, 15, 17	14	3,4,5, 8a, 8b	-	4	E9 - Generic industrial use of borates as processing aids in processes and products	ES17 - Make up of treatment baths for galvanising, plating and other surface treatments ES29 - Galvanising, plating and other surface treatments of metal articles
47	Oil industry	Formulation into cement		X				2b	K35100	2, 3, 8b	-	2	E4 - Generic formulation of borates into mixtures	ES16 - Closed production at ambient temperatures ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES21 - General maintenance activities ES32 - Working in a laboratory
48	Oil industry	Industrial use of cement			X			2b	K35100	8b, 4	-	5	E11 - Generic industrial use of borates resulting in inclusion into or onto a matrix	ES16 - Closed production at ambient temperatures ES18 - Transfer of substances or preparations from/to large vessels/containers at dedicated facilities ES32 - Working in a laboratory

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
49	Photography	Formulation into photographic solutions		X				3, 10	20 30	4, 5, 8b, 9	-	2	E4 - Generic formulation of borates into mixtures	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels ES22 - Transfer of substances into small containers
50	Photography	Industrial use of photographic solutions			X			3	30	19	-	4	E9 - Generic industrial use of borates as processing aids in processes and products	ES35 - Make up of stock solution for photographic applications
51	Photography	Professional use of photographic solutions			X			22	30	13, 19	-	8a	E23 - Generic wide dispersive use of borates with 100% release to water	ES30 - Use of developer and fixer solutions ES35 - Make up of stock solution for photographic applications
53	Printing paper	Formulation of borate PVA solutions		X				3, 10	20	4, 5, 8b	-	1, 6a, 6b	E2 - Generic industrial use of borates resulting in the manufacture of another substance	ES7 - Discharging bags (25 -50 kg) into mixing vessels ES8 - Discharging big bags (750 – 1500kg) into mixing vessels

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.