# SAFETY DATA SHEET

## Section 1. Identification

**Product identifier** : ***Granubor*®**

**Chemical name** : Disodium tetraborate pentahydrate

**Other means of identification** : Borax pentahydrate, Sodium tetraborate pentahydrate, Borax 5 mol

**Product type** : Solid.

**Recommended use of the chemical and restrictions on use**

**Material uses** : Micronutrient fertiliser

**Supplier's details** : U.S. Borax Inc.
14486 Borax Road
Boron, CA 93516-2000
USA
+1 (760) 762 7000

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

**Emergency telephone number** : APAC +65 3158 1074 (24-Hr Non toll-free number) (Rio Tinto Borates)
AMERICAS +1 866 928 0789 (Toll Free (24 Hr)) or
+1 215 207 0061 (Non-Toll Free (24 Hr))(Rio Tinto Borates)
For advice on chemical emergencies, spillages, fires or first aid.

## Section 2. Hazard identification

**Classification of the substance or mixture** : ACUTE TOXICITY (oral) - Category 5
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
TOXIC TO REPRODUCTION - Category 2

**GHS label elements**

**Hazard pictograms** :

**Signal word** : Warning

**Hazard statements** : May be harmful if swallowed.
Causes serious eye irritation.
Suspected of damaging fertility or the unborn child.

**Precautionary statements**

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

**Prevention** : Wear eye protection.

**Response** : IF exposed or concerned: Get medical advice/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/container in accordance with local regulation.

# Section 2. Hazard identification

**Other hazards which do not result in classification** : None known.

# Section 3. Composition/information on ingredients

**Substance/mixture** : Substance

**Chemical name** : Disodium tetraborate pentahydrate

| Ingredient name | % | Identifiers |
|---|---|---|
| Disodium tetraborate pentahydrate | >99 | CAS: 12179-04-3<br>EC: 215-540-4 |

**There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

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

# Section 4. First aid measures

## Description of necessary 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.

## Most important symptoms/effects, acute and delayed

### 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.

### 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.

## Indication of immediate medical attention and special treatment needed, if necessary

**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.

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

**See toxicological information (Section 11)**

# Section 5. Fire-fighting measures

## Extinguishing media

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

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : None. The product is not flammable, combustible or explosive.

**Hazardous thermal decomposition products** : None.

**Special protective actions for fire-fighters** : None.

**Special protective equipment for fire-fighters** : Not applicable.

**Remark** : Not explosive.

# Section 6. Accidental release measures

## Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**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.

## Methods and materials for containment and cleaning up

# Section 6. Accidental release measures

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

**Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

## 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.

**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)

# Section 8. Exposure controls/personal protection

## Control parameters

### Occupational exposure limits

| Ingredient name | Exposure limits |
|---|---|
| | 1. Argentina, Peru, Venezuela: 1 mg/m$^3$ [8-hr TWA]; nil mg/m$^3$ [15 min STEL]<br>2. Columbia, Costa Rica, Dominion Republic, Ecuador, Nicaragua, Paraguay, Uruguay : 2 mg/m$^3$ [8-hr TWA];6 mg/m$^3$ [15 min STEL] |

### Biological exposure indices

No exposure indices 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/m$^3$. To convert product into equivalent boron (B) content, multiply by 0.1484.

**Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor 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.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## 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.

# Section 8. Exposure controls/personal protection

**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.
Recommended: Eye protection according to ANSI Z.87.1 or other national standards are 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.

**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.

# Section 9. Physical and chemical properties and safety characteristics

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

**Appearance**

**Physical state** : Solid. [Crystalline]

**Color** : White.

**Odor** : Odorless.

**Odor threshold** : Not applicable. [Odorless.]

**pH** : 9.23 [Conc. (% w/w): 3.5%]

**Melting point/freezing point** : >1000°C (>1832°F)

**Boiling point or initial boiling point and boiling range** : Not applicable. [melting point >300°C]

**Flash point** : Not applicable. Inorganic substance.

**Burning time** : Not available.

**Burning rate** : Not available.

**Evaporation rate** : Not applicable (solid). [Non-volatile.]

**Flammability** : Non-flammable. The product is not flammable, combustible or explosive.

**Lower and upper explosion limit/flammability limit** : Not applicable. Non-flammable.

**Vapor pressure** : Not applicable. Melting point >300°C

**Relative vapor density** : Not applicable. Melting point >300 °C

**Bulk density** : Not available. Depends on batch.

**Granulometry** : Not available. Depends on batch.

**Relative density** : 2.35 @ 26°C (anhydrous); 1.72 @ 23°C (decahydrate)

**Density** : 1.72 g/cm³ [23°C (73.4°F)]

**Solubility in water** : 49.74 g/l

**Partition coefficient: n-octanol/water** : -1.53 @ 22 °C (decahydrate)

**Auto-ignition temperature** : Not applicable (solid). [Not self-heating.]

**Decomposition temperature** : Not applicable. Melting point >300°C

**SADT** : Not applicable.

# Section 9. Physical and chemical properties and safety characteristics

**Viscosity** : Dynamic (room temperature): Not applicable (not liquid). [solid substance]
Kinematic (room temperature): Not applicable (not liquid). [solid substance]
Kinematic (40°C (104°F)): Not applicable (not liquid).

**Flow time (ISO 2431)** : Not available.

**Molecular weight** : 291.35

**Particle characteristics**

**Median particle size** : Not available.

# Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : Under ambient temperatures, the product is stable. When heated it loses water, eventually forming anhydrous borax ($Na_2B_4O_7$).

**Possibility of hazardous reactions** : Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

**Conditions to avoid** : Avoid contact with strong reducing agents by storing according to good industrial practice.

**Incompatible materials** : Strong reducing agents

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

# Section 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity**

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **Rat - Oral - LD50**<br>3305 mg/kg<br>EPA [FIFRA Guidelines]<br>Toxic effects: Small amounts (e.g. a teaspoonful) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.<br>**Rabbit - Dermal - LD50**<br>>2000 mg/kg<br>EPA [FIFRA Guidelines]<br>Toxic effects: Poorly absorbed through intact skin.<br>**Rat - Inhalation - LC50 Dusts and mists**<br>>2 mg/l [4 days]<br>OECD 403 [Acute Inhalation Toxicity]<br>Toxic effects: Low acute inhalation toxicity. LC50 in rats is > 2.0 mg/l (or $g/m^3$).Based on the available data, the classification criteria are not met. |

**Conclusion/Summary [Product]** : May be harmful if swallowed.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | Draize test in rabbits produced eye irritation effects. Therefore, this product may be considered to be an eye irritant. |

**Skin corrosion/irritation**

| Product/ingredient name | Result |
|---|---|

# Section 11. Toxicological information

| | |
|---|---|
| Disodium tetraborate pentahydrate | **New Zealand White Rabbit - Skin - No irritation.**<br>EPA<br>Amount/concentration applied: 0.5 g moistened with saline |

**Conclusion/Summary [Product]** : Non-irritating to the skin. Based on the available data, the classification criteria are not met.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | Non-irritant to skin. |

## Serious eye damage/eye irritation

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **New Zealand White Rabbit - Eyes - Irritant**<br>OECD 405<br>Amount/concentration applied: 0.08 ml equivalent<br>Fully reversible in more than 7 days |

**Conclusion/Summary [Product]** : Causes serious eye irritation. Irritating, fully reversible within 14 days. Many years of occupational exposure indicate no adverse effects on human eye.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | Causes serious eye irritation. |

## Respiratory corrosion/irritation

Not available.

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

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | Occasional mild irritation effects to the nose and throat may occur from inhalation of product dust at levels greater than 10 $mg/m^3$. |

## Respiratory or skin sensitization

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **Guinea pig - skin**<br>OECD 406<br>Result: Not sensitizing |

### Skin

**Conclusion/Summary [Product]** : Not a skin sensitizer. Based on the available data, the classification criteria are not met.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | Non-sensitizer to skin. |

### Respiratory

**Conclusion/Summary [Product]** : No respiratory sensitization studies have been conducted. There are no data to suggest that disodium tetraborates are respiratory sensitizers. Based on the available data, the classification criteria are not met.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | No respiratory sensitization studies have been conducted. There are no data to suggest that disodium tetraborates are respiratory sensitizers. Based on available data, the classification criteria are not met. |

# Section 11. Toxicological information

## Germ cell mutagenicity

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **In vitro - Mammalian-Animal - Germ**<br>(based on boric acid).<br>1000 to 10000 ppm<br>Result: Negative |

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

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | 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) 1272/2008. |

## Carcinogenicity

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **Rat - Oral - NOEL**<br>OECD 451 equivalent [Carcinogenicity Studies]<br>446 to 1150 mg/kg<br>Result: Negative |

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

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | No evidence of carcinogenicity (based on boric acid). Based on the available data, the classification criteria are not met. |

## Reproductive toxicity

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **Rat - Oral**<br>OECD 416 [Three-generation feeding study. Two-Generation Reproduction Toxicity Study]<br>Effects: NOAEL in rats for effects on fertility in males is 17.5 mg B/kg body weight.<br>Fertility effects: Positive<br>**Human - Inhalation**<br>Effects: 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.<br>Maternal toxicity: Negative<br>Fertility effects: Negative<br>Developmental: Negative<br>**Rat - Oral**<br>Prenatal Developmental Toxicity Study<br>Effects: 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<br>Maternal toxicity: Positive<br>Developmental: Positive |

# Section 11. Toxicological information

**Conclusion/Summary [Product]** : 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. 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.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | 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. 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. 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. |

## Specific target organ toxicity (single exposure)

| Product/ingredient name | Result |
|---|---|
| Based on the available data, the classification criteria are not met. | |

## Specific target organ toxicity (repeated exposure)

| Product/ingredient name | Result |
|---|---|
| Based on the available data, the classification criteria are not met. | |

## Aspiration hazard

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | Physical form of solid powder indicates no aspiration hazard potential. |

## Information on the 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.**

## 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

# Section 11. Toxicological information

**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.

**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 and also 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 |
|---|---|
| Disodium tetraborate pentahydrate | **Chronic - Rat - Oral - NOAEL**<br>OECD 452 [Chronic toxicity study of boric acid and disodium tetraborate decahydrate, similar to OECD 452.]<br>17.5 mg/kg<br>Toxic effects: A NOAEL of 17.5 mg B/kg bw/day equivalent to 118 mg sodium tetraborate pentahydrate/kg bw/day was determined in a chronic feeding study (2 years) in rats and is based on testes effects. Other effects (renal, hematopoietic systems) are only observed at even higher doses. |

**Conclusion/Summary [Product]** : A NOAEL of 17.5 mg B/kg bw/day equivalent to 118 mg sodium tetraborate pentahydrate/kg bw/day was determined in a chronic feeding study (2 years) in rats and is based on testes effects. Other effects (renal, hematopoietic systems) are only observed at even higher doses.

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.

| Ingredient name | Conclusion/Summary |
|---|---|

# Section 11. Toxicological information

| | |
|---|---|
| Disodium tetraborate pentahydrate | Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility. |

**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 fertility or the unborn child.

## Numerical measures of toxicity

### Acute toxicity estimates

| Product/ingredient name | Oral (mg/kg) | Dermal (mg/kg) | Inhalation (gases) (ppm) | Inhalation (vapors) (mg/l) | Inhalation (dusts and mists) (mg/l) |
|---|---|---|---|---|---|
| Disodium tetraborate pentahydrate | 2500 | N/A | N/A | N/A | N/A |

# Section 12. Ecological information

## Toxicity

| Product/ingredient name | Result |
|---|---|
| Disodium tetraborate pentahydrate | **NOEC**<br>Fish.<br>*Brachydanio rerio*<br>6.4 mg/l - (as Boron)<br>Fresh water - Chronic<br>**LC50**<br>Invertebrate<br>*Ceriodaphnia dubia*<br>91 mg/l - (as Boron)<br>Fresh water - Acute<br>**LC50**<br>Fish.<br>*Pimephales promelas*<br>79.7 mg/l - (as Boron)<br>Fresh water - Acute<br>**NOEC**<br>Algae<br>*Pseudokirchneriella subcapitata*<br>17.5 mg/l - (as Boron)<br>Fresh water - Chronic<br>**NOEC**<br>Invertebrate<br>*Daphnia magna*<br>14.2 mg/l - (as Boron)<br>Fresh water - Chronic<br>**EC50**<br>Algae<br>*Pseudokirchneriella subcapitata*<br>52.4 mg/l - (as Boron)<br>Fresh water - Acute |

# Section 12. Ecological information

**Conclusion/Summary [Product]** : Note that the data values are expressed as boron equivalents. To convert this product into equivalent boron (B) content, multiply by 0.1484. 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.

| Ingredient name | Conclusion/Summary |
|---|---|
| Disodium tetraborate pentahydrate | Boron (B) is the element which is used by convention to report borate product ecological effects. |

## Persistence and degradability

| Product/ingredient name | Result |
|---|---|
| Not applicable. | |

**Conclusion/Summary [Product]** : Not applicable. Inorganic substance.

## Bioaccumulative potential

| Product/ingredient name | $LogP_{ow}$ | BCF | Potential |
|---|---|---|---|
| Disodium tetraborate pentahydrate | -0.757 | - | Low |

## Mobility in soil

**Soil/Water partition coefficient** : Not available.

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

## Other adverse effects

No known significant effects or critical hazards.

# Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. 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. Waste packaging should be recycled. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

# Section 14. Transport information

# Section 14. Transport information

| | UN | IMDG | IATA |
|---|---|---|---|
| **UN number** | Not regulated. | Not regulated. | Not regulated. |
| **UN proper shipping name** | - | - | - |
| **Transport hazard class(es)** | - | - | - |
| **Packing group** | - | - | - |
| **Environmental hazards** | No. | No. | No. |

**Special precautions for user** : Not applicable.

**Transport in bulk according to IMO instruments** : Not applicable.

# Section 15. Regulatory information

## International regulations

### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

### Montreal Protocol

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 inventory (AIIC)** : All components are listed or exempted.

**Canada inventory** : All components are listed or exempted.

**China inventory (IECSC)** : All components are listed or exempted.

**Eurasian Economic Union** : **Russian Federation inventory**: All components are listed or exempted.

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

**Korea inventory** : All components are listed or exempted.

**New Zealand Inventory of Chemicals (NZIoC)** : All components are listed or exempted.

**Philippines inventory (PICCS)** : All components are listed or exempted.

**Taiwan Chemical Substances Inventory (TCSI)** : All components are listed or exempted.

**Thailand** : All components are listed or exempted.

**Turkey inventory** : Not determined.

# Section 15. Regulatory information

**United States inventory (TSCA 8b)** : All components are active or exempted.

**Viet Nam** : All components are listed or exempted.

# Section 16. Other information

## History

**Date of issue/Date of revision** : 2025/10/16

**Date of previous issue** : 2015/02/27

**Version** : 1

**Key to abbreviations** : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
IMSBC = International Maritime Solid Bulk Cargoes Code
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
UN = United Nations

## Procedure used to derive the classification

| Classification | Justification |
|---|---|
| ACUTE TOXICITY (oral) - Category 5 | Expert judgment |
| SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A | Expert judgment |
| TOXIC TO REPRODUCTION - Category 2 | Expert judgment |

**Additional information** : Keep out of reach of children.
Do not ingest.
Refer to safety data sheet.
Not for use in drugs, pesticides or for food preservation.
Use only as directed.

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

**Indicates information that has changed from previously issued version.**

UN / 4.14 / EN-US

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# Section 16. Other information

RELIANCE UPON THIS INFORMATION.