

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 Product identifier

- Commercial Name: **FOLIAREL 21%**
- Chemical Formula: $\text{Na}_2\text{B}_8\text{O}_{13} \cdot 4\text{H}_2\text{O}$
- Chemical Name/synonyms: DOT, **Disodium Octaborate Tetrahydrate**
- Chemical Family: Inorganic Borates
- REACH registration N°: **01-2119490860-33-0002**
- CAS registry N° : 12280-03-4
- EINECS N°: 234-541-0

1.2 Relevant identified uses of the substance and uses advised against

Binding agent, Chemical production, Complexing agent, Corrosion inhibitors and anti-scaling agents, Fertilisers, Flame retardants, Flux agents for casting, Intermediate, Laboratory chemicals, Lubricants and lubricant additives, Oxidising agents, Photosensitive agents and other photo-chemicals, pH-regulating agents, Plating agents and metal surface treating agents,

Process regulator (other than polymerisation or vulcanization processes), Process regulator (used in polymerisation or vulcanization processes), Processing aid not otherwise listed, Stabilisers Surface active agents, Viscosity modifiers

A complete list of uses is provided into the attached exposure scenarios

Uses advised against: Consumer uses above the specific concentration limit.

1.3 Details of the supplier of the safety data sheet

Manufacturer

SCL Italia spa

Headquarter: Via F. Filzi 25/A - 20124 Milan, ITALY

Tel. +39-02-677168.1 Fax +39-02-677168.20; <http://www.scl.it>

e-mail : bianchi@scl.it

1.4 Emergency telephone number

- Centro antiveneni di Milano - Ospedale Niguarda Ca' Granda
tel. **+39 02-66101029**
- SCL Italia spa: +39-02-677168.1*

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

Not Hazardous (According OSHA, 29 CFR 1910.1200 - Appendix D (GHS))

2.2 Label elements (According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010)

SCL Italia spa

Headquarter: Via F. Filzi 25/A - 20124 Milan Italy Tel. 02/67716820

Plant: P.zza Leopolda n. 2 - 56044 Larderello (PI) Italy Tel. 0588/68811

USA only (NFPA rating):

HAZARD RATING (NFPA)

HEALTH: 0

FIRE: 0

REACTIVITY: 0

Hazard Rating Scale:

0=MINIMAL

1=SLIGHT

2=MODERATE

3=SERIOUS

4=SEVERE

2.3 Other hazards

- Environment:** Large amounts of the product can be harmful to plants and other species. Therefore releases to the environment should be minimised. (See sec. 12)
- PBT or vPvB:** substance is not PBT or vPvB

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical Name	Conc. (%)	N° EINECS	N° CAS	Category	Hazard statement
Disodium Octoborate Tetrahydrate (DOT)	100	234-541-0*	12280-03-4	Repr. Cat. 1B	H360FD

*For one EINECS number you can have more than one CAS number .

3.2 Mixtures

Not applicable

4 FIRST AID MEASURES

4.1 Description of first aid measures

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

- **Inhalation:** if symptoms such as nose or throat irritation are observed, remove person to fresh air . No specific treatment is necessary.
- **Skin contact:** No treatment is necessary because non-irritating. To wash the area with soap and abundant water some minutes .
- **Eye contact:** Use eye wash fountain or fresh water to clean the eyes. If irritation persists for more than 30 minutes, seek medical attention.
- **Ingestion:** The product is not intended for ingestion. Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

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

5 FIREFIGHTING MEASURES

5.1 Extinguishing media

Any fire extinguishing media may be used on nearby fires. Use extinguishing media that are appropriate to local circumstances and the surrounding environment.

Forbidden extinguishing means: none.

5.2 Special hazards deriving from the substance

None . The substance is not flammable, combustible or explosive

5.3 Advice for firefighters

Apply standard procedures. No specific precaution is necessary. Some boron products are used as a flame retardant.

6 ACCIDENTAL RELEASE MEASURES

FOLIAREL 21%

According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

6.1 Personal precautions protective equipment and emergency procedures

6.1.1 For non-emergency personnel

For normal industrial exposures are not required gloves and protective goggles, however must be considered one eye protection complying with CEN166: 1996, Respirators (CEN149) in case of excessively dusty environment. (FFP3)

6.1.2 For emergency responders

For normal industrial exposures are not required gloves and protective goggles, however must be considered one eye protection complying with CEN166: 1996, Respirators (CEN149) in case of excessively dusty environment. (FFP3)

6.2 Environmental precautions

the product is a white powder that is soluble in water can cause damage to the plants or vegetation through absorption by the roots. Avoid contamination of water bodies during cleaning and disposal. Local water authorities advise not to use the contaminated water for irrigation or drinking water extraction until the natural dilution will have no reported boron values to normal environmental reference levels.

6.3 Methods and material for containment and cleaning up

Appropriate containment: prevent spills in water and cover discharges.

Spills into the ground: aspirate, remove it with the help of a shovel or a broom and place in container for disposal according to local regulations apply.

Water spill: if possible, remove the water intact containers.

6.4 Reference to other sections

See section 8,12 and 13

7 HANDLING AND STORAGE

7.1 Precautions for safe Handling

Valid internal procedures must be adopted to minimize the production and accumulation of dust. Avoid spillage. Do not eat, drink or smoke in working areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering areas where meals are consumed.

- Store in cool, dry and well-ventilated place, away from strong reducing agents ;
- keep preferably at a temperature between 20°C and 25°C;

Conditions to avoid:

- high air humidity
- sunlight exposure
- temperatures under -5 °C and over 40°C .

7.2 Conditions for safe storage, including any incompatibilities

Does not require special precautions handling; however , to preserve the integrity of the packaging and minimize product caking

- manipulate the bags on the basis of the principle "first-in, first-out".

7.3 Specific end use(s)

See exposure scenarios.

8 EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limits : in the absence of national occupational

- PNECs

Environment	PNEC
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According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

exposure limit values, SCL Italia spa recommends and applies an internal occupational exposure limit **2 mg/m³**. To convert the product into a level of boron (B) equivalent, multiply by 0,2097.

Occupational exposure limits (OELs) EEA Member States

Country	8h -TWA (mg/m ³)	15'- STEL (mg/m ³)	Reg./Law
Belgium	2	6	Moniteur Belge n. 187, 30-06-2011
Germany	2,6	5,2	TRGS 900 Arbeitsplatzgrenzwerte, 12-01-2012
Italy	2	6	Legge n. 106, 3-08-2009
Latvia	10	-	Norme n. 92, 1-02-2011
Lithuania	10	-	Norma in materia di igiene HN 23:2007; Ordinanza n. V-827/A1-287, 15 ottobre 2007
Spain	2	6	Valores Límites Ambientales (VLAs), Table 1, Límites de Exposición Profesional para Agentes Químicos 2011
USA	2	6	ACGIH

DNELs workers:

Route of exposure	Acute Local Effects	Acute Systemic Effects	Local Chronic Effects	long-term systemic Effects
Oral	No prescription or requirements			
Inhalation	*	*	*	8.28 mg/m ³
Dermal	*	*	*	392 mg/kg bw/day

DNELs General Population:

Route of exposure	Acute Local Effects	Acute Systemic Effects	Local Chronic Effects	long-term systemic Effects
Oral	*	0.98 mg/kg bw/day	*	0.98 mg/kg bw/day
Inhalation	*	*	*	4.15 mg/m ³
Dermal	*	*	*	196 mg/kg bw/day

* No hazard identified

Monitoring procedures: BS EN 14042: 2003 title Identifier: Atmosphere in the workplace. Application guide and the use of procedures for the assessment of exposure to chemical and biological agents

Fresh water	2.02 mg B/L
Marine water	2.02 mg B/L
Intermittent releases	13.7 mg/L
air	No exposure of expected
soil	5.4 mgB/kg soil dw
sediment (fresh water)	Dispensed because of non-separation of sediment
STP	10 mg B/L

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

Use local exhaust ventilation to keep airborne concentrations of dust below permissible exposure limits.

8.2.2 Individual protection measures, such as personal protective equipment

- Hand protection:** the use of gloves for chemical protection is suggested. Do not eat or smoke while handling the product. Wash hands after contact with material and before eating and at the end of the work shift.
- Respiratory protection:** Wear protective masks (class FFP3) for long exposures and high concentration levels
- Eye protection:** Wear security glasses for long exposures and high concentration levels .
- Skin protection:** Wear conventional working clothes.

8.2.3 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.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- Appearance:** White crystalline solid (powder);

- Solubility:**
 - Water solubility:

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According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

- **Odour:** Odourless
 - **Olfactory threshold:** N.A.
 - pH at 20°C:
Concentration 10 g/l : 8.5
Concentration 100 g/l : 7.6
 - Boiling point: N.A.
 - Flammability point: N.A.
Flammability:
 - Not flammable
 - Not combustible
 - Explosive properties: N.A.
 - Comburent properties: N.A.
 - Vapour pressure: Negligible at 20°C
 - Bulk Density : 1874 Kg/m³ at 22°C
 - Relative density :1,87 at 22°C
- at 20°C : 223 g/l H₂O
 - at 60°C : 421 g/l H₂O
 - soluble in ethylene glycol, glycerine, lightly in alcohols
 - Partition coefficient octanol/water :
Log P_{ow} : - 0,7570 at 25°C
 - Viscosity: N.A.
 - Evaporation rate: N.A.

9.2 Other Informations

- Does not contain organic solvents
- No oxidising
- Melting point: > 300°C
- Molecular weight : 412,52
- Decomposition Temperature: If heated to a temperature higher than 100° C, the water is dispersed.

10 STABILITY AND REACTIVITY

10.1 Reactivity

none known.

10.2 Chemical stability

this product is stable at normal ambient temperatures (from -40° C to + 40° C). When heated, the product loses water .

10.3 Possibility of hazardous reactions

DOT is a weak acid can corrode the metals. Reaction with strong reducing agents such as metal hydrides and alkali metals, generates hydrogen gas which may cause a danger of explosion.

10.4 Conditions to avoid

avoid contact with strong reducing agents by storing the product in accordance with good industrial practice.

10.5 Incompatible materials

strong reducing agents.

10.6 Hazardous decomposition products

none

11 TOXICOLOGICAL INFORMATIONS

11.1 Information on toxicological effects

(d) Respiratory or skin sensitisation:

FOLIAREL 21%

According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

a) Acute toxicity

Method: Acute Oral Toxicity Study – OECD Guideline 401

Species: Rat

Dose: 2000 – 5000 mg/kg body weight

Routes of Exposure: Oral

Results: Low acute oral toxicity. The oral LD50 value in male rats is 3,450 mg/kg bw, and in female rats is 4080 mg/kg bw. Based on the available data, the classification criteria are not met.

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

Species: Rabbit

Dose: 2,000 mg/kg bw

Routes of Exposure: Dermal

Results: Low acute dermal toxicity; LD50 in rabbits is > 2,000 mg/kg of body weight. Poorly absorbed through intact skin. Based on the available data, the classification criteria are not met.

Method: Acute Inhalation Toxicity Study – OECD Guideline 403

Species: Rat

Dose: 2.12 mg/L

Routes of Exposure: Inhalation

Results: Low acute inhalation toxicity; LC50 in rats is > 2.0 mg/l (or g/m3). Based on the available data, the classification criteria are not met.

(b) Skin corrosion / irritation:

Method: Primary Dermal Irritation Study – EPA FIFRA (40 CFR 163)

Species: New Zealand White Rabbit

Dose: 0.5 g moistened with saline

Routes of Exposure: Dermal

Results: No skin irritation. Mean Primary Irritation Score: 0.1. Based on the available data, the classification criteria are not met.

(c) Serious eye damage / irritation:

Method: Eye Irritation Study – similar to OECD Guideline 405

Species: New Zealand White Rabbit

Dose: 0.1 g

Routes of Exposure: Eye

Results: Not irritating, corneal involvement or irritation clearing in 7 days. Classification: Based on mean scores < 1, and the effects were fully reversible within 7 days, the classification criteria are not met. Many years of occupational exposure indicate no adverse effects on human eye.

Classification: Reproductive Toxicity Category 1B (Hazard statement: H360FD: May damage fertility or the unborn child.)

Method: Occupational studies of evaluating sensitive sperm parameters in

Method: Buehler Test – OECD Guideline 406

Species: Guinea Pig

Dose: 0.4 g 95 % w/w/boric acid

Routes of Exposure: Dermal

Results: Not a skin sensitiser. No respiratory sensitisation studies have been conducted. There are no data to suggest that boric acid is a respiratory sensitiser. Based on the available data, the classification criteria are not met.

(e) Germ cell mutagenicity:

Method: Several in vitro mutagenicity studies have been carried out on boric acid including gene mutation in mammalian cells, unscheduled DNA synthesis, chromosomal aberration and sister chromatid exchange in mammalian cells.

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

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

Routes of Exposure: in vitro

Results: Not mutagenic. Based on the available data, the classification criteria are not met.

(f) Carcinogenicity:

Method: OECD 451 equivalent.

Species: B6C3F1 mice

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

Routes of Exposure: Oral feeding study

Results: No evidence of carcinogenicity. Based on the available data, the classification criteria are not met.

(g) Reproductive toxicity:

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

Species: Rat

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

Routes of Exposure: Oral feeding study

Results: NOAEL in rats for effects on fertility in males is 100 mg boric acid/kg bw equivalent to 17.5 mg B/kg bw.

Method: Prenatal Developmental Toxicity Study of Boric Acid – OECD Guideline 414

Species: Rat

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

Routes of Exposure: Oral feeding study

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

(i) STOT-repeated exposure:

Method: Chronic toxicity study of boric acid, similar to OECD 452

According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

highly exposed borate workers. Epidemiological studies evaluating high environmental exposures to boron and developmental effects in humans have been conducted.

Species: Human

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

Routes of Exposure: Combined oral ingestion and inhalation

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

Summary of evaluation of the CMR properties:

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

(h) STOT-single exposure:

Method: Standard Test Method for Estimating Sensory Irritancy of Airborne Chemicals – ASTM E981-04 (2004)

Species: Mouse

Dose: 221 - 1096 mg boric acid/m³

Routes of Exposure: Inhalation

Results: The highest concentration of boric acid that was achievable with acceptable control of the aerosol concentration was 1096 mg/m³ with a %RD of 19%. The lowest exposure tested of 221 mg/m³ boric acid resulted in a reduced respiration rate of 9%, graded as no irritation. Based on the available data, the classification criteria are not met.

Method: Sensory irritation in human volunteers

Species: Human

Dose: 2.5, 5, 10 mg boric acid/m³

Routes of Exposure: Inhalation

Results: No irritation from boric acid was observed at exposures up to 10 mg/m³ among male and female human volunteers under controlled laboratory conditions.

Species: Rat

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

Routes of Exposure: oral: feed

Results: A NOAEL of 17.5 mg B/kg bw/day equivalent to 100 mg boric acid/kg bw/day was determined in a chronic feeding study (2 years) in rats and is based on testes effects. Other effects (kidney, haemopoietic system) are regarded only at even higher dose levels. Based on the available data, the classification criteria are not met.

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

Toxicokinetics

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

Information on likely routes of exposure:

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

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

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

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

Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid and sodium borate dust. Human epidemiological studies indicate no effect on fertility in occupational populations with chronic exposures

12.1 Toxicity

Phytotoxicity: Boron occurs naturally in sea water at an average concentration of 5 mg B/l and fresh water at 1 mg B/l or less. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert boric acid into equivalent boron (B) content, multiply by 0,2097. Boron is an essential micronutrient for healthy growth of plants, however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimize the amount of borate product released to the environment.

Fresh Water

Chronic Studies

Taxonomic Group	N° of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	Ref.
Algal	4	10mgB/L (Chlorella pyrenoidosa) to 50 mg B/L (Anacystis nidulans)	3,4
Higher plants	3	4.0mgB/L (Phragmites australis) to 60 mg B/L (Lemna minor)	5,6
Invertebrate and protozoan	7	5.7mgB/L (Daphnia magna) to 32 mg B/L (Chironomus riparius)	7,8
Fish	6	2.9mgB/L (Micropterus salmoides) to 17 mg B/L (Carassius auratus)	9
Amphibian	2	86 mg B/L (Rana pipiens) to 104 mg B/L (Bufo fowleri)	9

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

Acute studies

Taxonomic Group	N° of Taxa Tested	Range of Endpoint Values (geometric EC/LC50)	Ref.
Algal	2	10 mg B/L (Chlorella pyrenoidosa) to 28 mg B/L (Selenastrum capricornutum)	3,10
Invertebrate and protozoan	9	113 mg B/L (Ceriodaphnia dubia) to 1376 mg B/L (Chironomus decorus)	11,12
Fish	7	80 mg B/L (Pimephales promelas) to 627 mg B/L (Onchorhynchus tshawytscha)	11,13
Amphibian	2	29 mg B/L (Rana pipiens) to 41 mg B/L (Bufo fowleri)	9

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

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

Terrestrial Data

Chronic studies

Marine and Estuarine Data

Chronic studies

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

Results²: No data are available for invertebrate or vertebrate species. The results from the freshwater data set are recommended as applicable to marine and estuarine species.

Acute studies

Taxonomic Group	N° of Taxa Tested	Range of Endpoint Values (geometric EC/LC50)	Ref.
Invertebrate	3	45 mg B/L (Litopenaeus vannamei) to 83 mg B/L (Americamysis bahia)	14,15
Fish	2	74 mg B/L (Limanda limanda) to 600 mg B/L (Onchorhynchus tshawytscha)	13,16

No data are available for algal species.

Sediment

Taxonomic Group	N° of Taxa Tested	Range of Endpoint Values (geometric EC/LC50)	Ref.
Invertebrate	1	82.4 mg B/kg sediment dw (Chironomus riparius)	17,18

Results²: Although limited, the data suggest that sediment organisms are within range of toxicity of aquatic organisms. In addition, the substance will not partition to the sediment, so a sediment/water partitioning approach is justified.

Sewage Treatment Plants (STP)

Taxonomic Group	N° of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	Ref.
Activated sludge	n.a.	>17.5 mg B/L to 100 mg B/L	19
Microbes	3	10 mg B/L (Opercularia bimarginata) to 20 mg B/L (Paramecium caudatum)	20

12.2 Persistence and degradability

According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

Taxonomic Group	N° of Taxa Tested	Range of Endpoint Values (geometric NOEC/EC10)	Ref.
Plant	2	7.2 mg B/kg dw (Zea mays) to 56 mg B/kg dw (Allium cepa)	21,22
Invertebrate	9	15.4 mg B/kg dw (Folsomia candida) to 87 mg B/kg dw (Caenorhabditis elegans)	23,24
Soil micro	7	12 mg B/kg dw (nitrogen mineralization and nitrification test) to 420 mg B/kg dw (soil nitrogen transformation test)	25,26

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

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

12.3 Bioaccumulative potential

This product will undergo hydrolysis in water to form undissociated boric acid. Boric acid will not biomagnify through the foodchain. Octanol/Water partition coefficient: Log Pow = -0.7570 @ 25°C

12.4 Mobility in soil

Nutrient for species vegetables. The product is soluble in water and is leachable through normal soil

12.5 Results of PBT and vPvB assessment

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

12.6 Other adverse effects

None

13 DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

This product is classified as toxic to reproduction (Repr. 1B) and falls within scope of Reg. 1357/2014 as hazardous waste (HP10). Dispose in accordance with applicable local regulations. Not disperse in city drain or water course.

Small quantities of boric acid can usually be disposed of at landfill sites. No special disposal treatment is required. Tonnage quantities of product are not recommended to be sent to landfills.

14 TRANSPORT INFORMATION

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

14.5 Environmental Hazards Not Regulated

14.1 UN Number: Not Regulated

14.6 Special precautions for user: Not Regulated

14.2 UN Proper Shipping Name: Not Regulated

14.7 Transport in bulk according to Annex II of Marpol 73/78 and the IBC code: Not Regulated

14.3 Transport hazard class(es): Not Regulated

14.4 Packing Group: Not Regulated

15 REGULATORY INFORMATIONS

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

▪ Italian legislation

- D.Lgs.152/06 Testo Unico Ambiente
- Dlg. 28/07/04 n° 260
- D.Lgs. 81/2008 Testo Unico della Sicurezza
- D.P.R.303/56
- D.P.R.1124/65

▪ European and International legislation

- Reg. CE n° 1907/2006 (REACH)
- CLP regulation
- Reg.CE n° 790/2009
- Reg.CE n°453/2010
- Reg. 1357/2014
- **OSHA, 29 CFR 1910.1200**

- **Regulation (EU) No 109/2012 – REACH Annex XVII:** Restricted to professional users. The product is permitted for use in consumer products where it is below the specific concentration limit.

▪ Clean Air Act (Montreal Protocol)

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

▪ Chemical inventory listing

- U.S. EPA TSCA Inventory 12280-03-4
- Canadian DSL 12280-03-4
- EINECS 234-541-0

15.2 Chemical Safety assessment

A Chemical Safety Assessment has been carried out. Due to the number of pages it is not possible to attach CSR. Please ask for an electronic copy to info@scl.it.

This SDS is in conformance with Reg.CE n°453/2010 , Reg.CE n° 790/2009 and **OSHA, 29 CFR 1910.1200**

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

16 OTHER INFORMATIONS

16.1 MEANING OF ASSIGNED “H” SENTENCES :

Hazard statement

-Not applicable for USA market

17. Gerke, A (2011a). Unpublished report to REACH Consortium for Borates.
18. Gerke, A (2011b). Unpublished report to REACH Consortium for Borates.
19. Hanstveit and Schoonmade (2000). Unpublished report no.: V99.156 to Borax Europe Limited.
20. Guhl (2000) SÖFW-Journal 126: 17-24.

According OSHA, 29 CFR 1910.1200 - Appendix D (GHS) and to Reg.EC n°453/2010

16.2 MEANING OF ASSIGNED "P" SENTENCES

Precautionary Statement Prevention

-Not applicable for USA market

16.3 TRAINING ADVICE :

- Reg. CE n° 1907/2006 (REACH)
- CLP regulation
- Reg.CE n° 790/2009
- Reg.CE n°453/2010
- D.Lgs. 81/2008 Testo Unico della Sicurezza

16.4 GENERAL BIBLIOGRAPHY

- The Merck Index.;
- Handling Chemical Safety;
- Niosh (Registry of Toxic Effects of Chemical substances);
- ELINCS (<http://ecb.jrc.it/existing-chemicals/>)
- Software Epy-plus ; ELINCS
- ACGIH TLV & IBE
- ECHA website

References

1. Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. (1986), 4, 427-458
2. Chemical Safety Report "Disodium Tetraborate, Anhydrous" December 2010, updated 2012 <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>
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6. Wang (1986) Environ Poll (Ser B) 11: 1-14.
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11. Soucek, Dickinson, Major (2010) Unpublished report to REACH Consortium for Borates.
12. Maier and Knight (1991) Arch. Environ. Contam. Toxicol. 20, 282 – 287.
13. Hamilton and Buhl (1990) Arch. Environ. Contam. Toxicol. 19, 366-373.
14. Li, et al. (2007) Aquaculture 278, 175-178.
15. Pillard et al. (2002) Environ Toxicol Chem, 21, 2131-213
16. Taylor et al. (1985) Aquat Toxicol, 7, 135-144.
21. Hosseini et al. (2007) J Plant Nutrition, 30, 773-781.
22. Aquaterra Environmental (1998) Unpublished report to Environment Canada, Environmental Technology Centre.
23. Becker-van Slooten, Campiche, Tarradellas (2003). Unpublished report to Environment Canada, Environmental Technology Centre.
24. Moser and Becker (2009) Unpublished report to REACH Consortium for Borates.
25. Van Laer, Salaets, Smolders (2010) Unpublished report to REACH Consortium for Borates.
26. Förster and Becker (2009) Unpublished report to REACH Consortium for Borates.
27. Cordia et al. (2003) Unpublished report no: PML 2002-C42r to Borax Europe, Ltd. For general information on the toxicology of borates see ECETOC Technical Report No. 63 (1995); Patty's Toxicology, 6th Edition Vol. I, (2012) Chap. 23, 'Boron'. Culver, BD & Hubbard SA (1995) Inorganic Boron Health Effects in Humans: An Aid to Risk Assessment and Clinical Judgment. Trace Elements in Experimental Medicine 9(4):175-184.

Abbreviations and acronyms:

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

All information on this SAFETY DATA SHEET are, to the best of our knowledge, correct, but should not be considered exhaustive. It is the user's responsibility to adopt and apply this data as appropriate.

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