SAFETY DATA SHEET

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Section 1. Identification

Product name : ***Zincubor***®

Chemical name : Hexaboron dizinc undecaoxide, hydrate

Other means of identification : Zinc borate hydrate (2335), dodecaboron, tetrazinc docosaoxide, heptahydrate, Dodecaboron tetrazinc docosaoxide heptahydrate

Product type : Solid.

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

Material uses : Intermediate use fertilizer

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 : Toll Free (24 Hr)
+1 866 928 0789
Non-Toll Free (24 Hr)
+1 215 207 0061 (Rio Tinto Borates)

For advice on chemical emergencies, spillages, fires or first aid.

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : TOXIC TO REPRODUCTION - Category 2
AQUATIC TOXICITY (ACUTE) - Category 1
AQUATIC TOXICITY (CHRONIC) - Category 2

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : Suspected of damaging the unborn child.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

Precautionary statements

Section 2. Hazards identification

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

Prevention : Avoid release to the environment.

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

Storage : Not applicable.

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

Hazards not otherwise classified : None.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Hexaboron dizinc undecaoxide, hydrate

CAS number/other identifiers

CAS number : 138265-88-0

Ingredient name	%	CAS number
Hexaboron dizinc undecaoxide, hydrate	>98.8	138265-88-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified 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 : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

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

Ingestion : 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 : No known significant effects or critical hazards.

Section 4. First aid measures

Inhalation : No known significant effects or critical hazards.

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

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

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 an extinguishing agent suitable for the surrounding fire.

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

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

Small spill : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, 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. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, 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
Hexaboron dizinc undecaoxide, hydrate	**OSHA PEL (United States). [Particulate Not Otherwise Classified or Nuisance Dust]** 15 mg/m³, (Total dust) 5 mg/m³, (Respirable dust) **Cal OSHA/PEL (United States). [Particulate Not Otherwise Classified or Nuisance Dust]** 5 mg/m³

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 this product to equivalent zinc (Zn), multiply by 0.301. To convert to equivalent boron (B), multiply by 0.149.

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.

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: safety glasses with side-shields. Recommended: Eye protection according to ANSI Z.87.1 or other national standards may be warranted if environment is excessively dusty.

Skin protection

Hand protection : Standard work gloves (cotton, canvas or leather) may be warranted if environment is excessively dusty.

Body protection : No special protective clothing is required.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

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

Appearance

Physical state : Solid. [Powder.]

Color : White.

Odor : Odorless.

Odor threshold : Not applicable. Odourless.

pH : 6.8 to 7.5 (Aqueous solution)

Melting point/freezing point : >300°C (>572°F) [EU A.1]

Boiling point, initial boiling point, and boiling range : Not applicable. Melting point >300°C

Flash point : Not applicable. Inorganic substance.

Evaporation rate : Not applicable. 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

Relative density : 2.6

Bulk density : not available. Depends on batch.

Density : 2.6 g/cm³ [20°C (68°F)]

Granulometry : not available. Depends on batch.

Solubility in water : <0.28% at 25°C

Partition coefficient: n-octanol/water : Not applicable. Inorganic substance.

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

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

Viscosity : Dynamic: Not applicable (not liquid). [solid substance]
Kinematic: Not applicable (not liquid). [solid substance]

Molecular weight : 434.66

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.

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

Section 10. Stability and reactivity

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

Absorption : Following a single oral dose (1000 mg/kg) of zinc borate (hydrate), zinc and boron appeared in rat plasma and tissue samples, indicating the hydrolysis of zinc borate in the gastrointestinal tract and subsequent systemic absorption of zinc and boron.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Hexaboron dizinc undecaoxide	LC50 Inhalation Vapor	Rat	>5 mg/l	4 hours
	LD50 Dermal	Rabbit	>2000 mg/kg Body weight:	-
	LD50 Oral	Rat	>5000 mg/kg Body weight:	-

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

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Hexaboron dizinc undecaoxide, hydrate	Eyes - No irritation.	Rabbit	<1	100 mg	-
	Skin - No irritation.	Rabbit	-	500 mg	-

Conclusion/Summary

Skin : Non-irritant to skin. Based on the available data, the classification criteria are not met.

Eyes : Based on mean scores less than 1, the effects were fully reversible within 7 days. Based on the available data, the classification criteria are not met.

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

Sensitization

Product/ingredient name	Route of exposure	Species	Result
Hexaboron dizinc undecaoxide, hydrate	skin	Guinea pig	Not sensitizing

Conclusion/Summary

Skin : Not a skin sensitizer. Based on the available data, the classification criteria are not met.

Respiratory : No respiratory sensitization 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.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Hexaboron dizinc undecaoxide, hydrate	OECD 476	Experiment: In vitro Subject: Mammalian-Animal Cell: Germ	Negative

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

Carcinogenicity

Section 11. Toxicological information

Conclusion/Summary : Zinc borate disassociates to zinc hydroxide and boric acid in the low pH environment of the stomach. No carcinogenic effects observed in chronic carcinogenicity studies of boric acid conducted in rats and mice, and no evidence of carcinogenic effects in zinc borate breakdown products. Based on the available data, the classification criteria are not met.

Classification

Product/ingredient name	OSHA	IARC	NTP
Hexaboron dizinc undecaoxide, hydrate	None.	-	-

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility Effects	Developmental effects	Species	Effects	Exposure
Hexaboron dizinc undecaoxide, hydrate	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.	Combined oral ingestion and inhalation.
	Positive	-	Positive	Rat	NOAEL in rats for developmental effects on the foetus including foetal weight loss and minor skeletal variations is < 100 mg zinc borate hydrate/ kg bw.	Oral feeding study
	-	Positive	-	Rat	NOAEL in rats for effects on fertility in males is 100 mg zinc borate (hydrate)/ kg/bw.	Oral feeding study

Conclusion/Summary : Developmental effects have been observed in laboratory animals, the most sensitive species being the rat (NOAEL 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. However, the low toxicity of zinc borate (acute oral LD50 is > 10,000 mg/kg) compared to other borates indicates that the bioavailability of boron from zinc borate may be low.

Section 11. Toxicological information

Teratogenicity

Conclusion/Summary : See Reproductive toxicity.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Based on the available data, the classification criteria are not met.			

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Based on the available data, the classification criteria are not met.			

Aspiration hazard

Name	Result
Hexaboron dizinc undecaoxide, hydrate	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 : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

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

Ingestion : This product is not intended for ingestion. Small amounts (e.g., a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms. Symptoms of accidental over-exposure to high doses of inorganic borate salts have been associated with ingestion or absorption through large areas of severely damaged skin. These may include nausea, vomiting, and diarrhoea, with delayed effects of skin redness and peeling.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

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

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

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Section 11. Toxicological information

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
Hexaboron dizinc undecaoxide, hydrate	Chronic NOAEL Oral	Rat	150 mg/kg /day	28 days

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

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : Suspected of damaging the unborn child.

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)
None					

Distribution : In plasma, T_{max} occurred between 5 and 6 h after administration. Concentrations decreased to background levels by 72 h post-dose; $T_{1/2}$ ranged from 5.0 to 7.7 h (zinc and boron, respectively).

Elimination : The gastrointestinal route was the primary elimination route for zinc, while urinary excretion via the kidneys was the primary elimination route for boron.

Section 12. Ecological information

Toxicity

Section 12. Ecological information

Product/ingredient name	Result	Species	Exposure
zinc	EC50 0.147 mg/l (as Zn)	*Ceriodaphnia dubia*	Fresh water - Acute
	LC50 0.169 mg/l (as Zn)	*Oncorhynchus mykiss*	Fresh water - Acute
	LC50 0.136 mg/l (as Zn)	*Pseudokirchneriella subcapitata*	Fresh water - Acute
	NOEC 0.037 mg/l (as Zn)	*Ceriodaphnia dubia*	Fresh water - Chronic
	NOEC 0.044 mg/l (as Zn)	*Jordanella floridae*	Fresh water - Chronic
	NOEC 0.019 mg/l (as Zn)	*Pseudokirchneriella subcapitata*	Fresh water - Chronic
boron	EC50 52.4 mg/l (as Boron)	*Pseudokirchneriella subcapitata*	Fresh water - Acute
	LC50 91 mg/l (as Boron)	*Ceriodaphnia dubia*	Fresh water - Acute
	LC50 79.7 mg/l (as Boron)	*Pimephales promelas*	Fresh water - Acute
	NOEC 6.4 mg/l (as Boron)	*Brachydanio rerio*	Fresh water - Chronic
	NOEC 14.2 mg/l (as Boron)	*Daphnia magna*	Fresh water - Chronic
	NOEC 17.5 mg/l (as Boron)	*Pseudokirchneriella subcapitata*	Fresh water - Chronic

Conclusion/Summary : Note that the data values are expressed as zinc ion or boron equivalents. To convert to this product, divide the zinc equivalent by 0.301 and divide the boron equivalent by 0.149. Studies judged to be unreliable or with insufficient information to evaluate are not included.

A study of the transformation/dissolution characteristics of zinc borate was conducted following the OECD 29 protocol. The amount of zinc ion in solution after 24 hr exceeded the acute reference values, so zinc borate is classified as Aquatic Acute 1 (H400: Very toxic to aquatic life). The amount of zinc in solution after 28 days also exceeded the chronic reference values. However, because over 70% of zinc ions were removed from the water column within 28 days (demonstrating "rapid partitioning") and zinc is not considered bioaccumulative, the Chronic 1 category does not apply.

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.

Persistence and degradability

Section 12. Ecological information

Conclusion/Summary : Not applicable. Inorganic substance

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Zinc borate will hydrolyze under environmental conditions to boric acid and zinc hydroxide via zinc oxide. Boric acid will not biomagnify through the food chain. Zinc hydroxide solubility is low under neutral and basic conditions (pH). The rate of hydrolysis depends on the initial loading and pH. However, zinc is an essential element which is actively regulated by organisms, so bioaccumulation is not considered relevant.			

Mobility in soil

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

Mobility : Zinc borate will hydrolyze under environmental conditions to boric acid and zinc hydroxide. Adsorption of boric acid to soils or sediments is minimal. Adsorption of zinc ions is described by partition coefficients and may vary with site-specific conditions. For boric acid, the solids-water partitioning coefficients are 2.19 L/kg (soil) and 2.8 L/kg (sediment). For zinc, the solids-water partitioning coefficients are 159 L/kg (soil), 73,000 L/kg (freshwater/sediment), and 6010 L/kg (seawater/sediment).

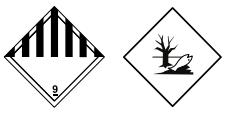
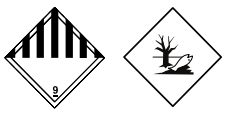
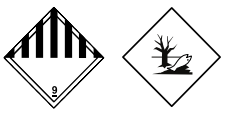
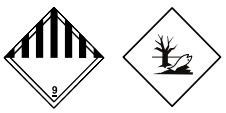
Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : Waste packaging should be recycled. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. 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. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	UN3077	UN3077	UN3077	UN3077	UN3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Hexaboron dizinc undecaoxide, hydrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Hexaboron dizinc undecaoxide, hydrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Hexaboron dizinc undecaoxide, hydrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Hexaboron dizinc undecaoxide, hydrate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Hexaboron dizinc undecaoxide, hydrate)
Transport hazard class(es)	9 	9 	9 	9 	9 
Packing group	III	III	III	III	III
Environmental hazards	Yes.	Yes.	Yes.	Yes.	Yes.

Additional information

DOT Classification : Non-bulk packages of this product are not regulated as hazardous materials unless transported by inland waterway. This product is not regulated as a hazardous material when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.43-2.45 (Class 9), 2.7 (Marine pollutant mark).
Non-bulk packages of this product are not regulated as dangerous goods when transported by road or rail.

Mexico Classification : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.

IMDG : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

IATA : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

Special precautions for user : Refer to sections 6, 8 and 12; The reportable quantity (RQ) of 454 kg (1000 lbs.) should always be included in the bill of lading.

The products identified above are classified by U.S. DOT as a Hazardous Substance with a reportable quantity (RQ) of 1,000 lbs. (454 kg) (49 CFR 172.101, Appendix A, and 49 CFR 171.8). DOT rules apply when these products are transported in quantities equal to or exceeding the RQ (1000 lbs.) in a single package. assigns the number UN 3077 to Hazardous Substances in the category to which zinc borate belongs. When transported in packages less than the RQ, they are not a DOT Hazardous Material. Bill of lading for DOT shipments should include the description – “Environmentally Hazardous substance, Solid, N.O.S., 9, UN 3077, PG III, RQ 1000 (Zinc Borate).”

The products identified above are not regulated under Canadian Transportation of Dangerous Goods (TDG). Zinc borate is not regulated as hazardous under the Canadian

Section 14. Transport information

Transportation of Dangerous Goods (TDG). Zinc borate by itself is not listed in Schedule 1 or 3 of the TDG nor is it listed in Appendix 1 Marine Pollutants.

Transport in bulk according to IMO instruments : Not applicable.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

Clean Water Act (CWA) 307: Clean Water Act (CWA) (Federal Water Pollution Control Act): 33 USC 1251 et seq.
a) This product is not itself a discharge covered by any water quality criteria of Section 304 of the CWA, 33 USC 1314.
b) It is on the Section 307 List of Priority Pollutants, 33 USC 1317, 40 CFR 129.
c) It is on the Section 311 List of Hazardous Substances, 33 USC 1321, 40 CFR 116.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : **Superfund**: CERCLA/SARA. This product is listed under CERCLA (Comprehensive Environmental Response Compensation and Liability Act) as a Hazardous Substance with a reportable quantity (RQ) of 1,000 lbs (454 kg), 42 USC 9604, 40 CFR 302. Zinc borate appears on the Emergency Planning and Community Right to Know Act (EPCRA) or Superfund Amendments and Reauthorization Act (SARA), Section 313, Toxic Chemicals Release Inventory list under zinc compounds, 42 USC 11023, 40 CFR 372.65. Zinc borate is not listed under Section 302 of SARA, Extremely Hazardous Substances, 42 USC 11002, 40 CFR 355, but because it is a CERCLA Hazardous Substance, emergency release reporting under SARA may be required if off-site releases exceed RQ.

SARA 311/312

Classification : TOXIC TO REPRODUCTION - Category 2
AQUATIC TOXICITY (ACUTE) - Category 1
AQUATIC TOXICITY (CHRONIC) - Category 2

Composition/information on ingredients

Section 15. Regulatory information

Name	%	Classification
Hexaboron dizinc undecaoxide, hydrate	>98.8	TOXIC TO REPRODUCTION - Category 2 AQUATIC TOXICITY (ACUTE) - Category 1 AQUATIC TOXICITY (CHRONIC) - Category 2

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Hexaboron dizinc undecaoxide, hydrate	12767-90-7	100
Supplier notification	Hexaboron dizinc undecaoxide, hydrate	12767-90-7	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : The following components are listed: ZINC compounds

Pennsylvania : The following components are listed: ZINC COMPOUNDS

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

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 : All components are listed or exempted.

China : All components are listed or exempted.

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

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

New Zealand : All components are listed or exempted.

Philippines : All components are listed or exempted.

Republic of Korea : All components are listed or exempted.

Taiwan : All components are listed or exempted.

Thailand : All components are listed or exempted.

Turkey : All components are listed or exempted.

United States : All components are active or exempted.

Section 15. Regulatory information

Viet Nam : All components are listed or exempted.

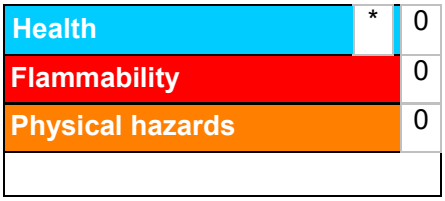
Canada

WHMIS (Canada) : TOXIC TO REPRODUCTION - Category 2
AQUATIC TOXICITY (ACUTE) - Category 1
AQUATIC TOXICITY (CHRONIC) - Category 2

Canadian NPRI : The following components are listed: zinc (and its compounds)

Section 16. Other information

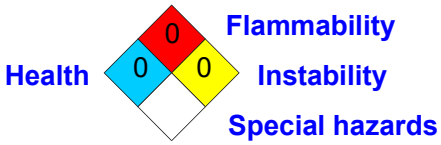
Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)



Procedure used to derive the classification

Classification	Justification
TOXIC TO REPRODUCTION - Category 2	Expert judgment
AQUATIC TOXICITY (ACUTE) - Category 1	Expert judgment
AQUATIC TOXICITY (CHRONIC) - Category 2	Expert judgment

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

History

Date of issue/Date of revision : 30/09/2024

Date of previous issue : 17/12/2020

Version : 1.01

Section 16. Other information

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

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.

United States / 4.13 / EN-US

Notice to reader

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