1 PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: ZINC BORATE HYDRATE
Common Name: Dodecarboron Tetrazinc Docosaoxide Heptahydrate
SDS Number: 100
Revision Date: 1/1/2021
Version: 1.2
CAS Number: 138265-88-0
Product Use: Flame retardant

Supplier Details: Rose Mill Company
100 Brook Street
West Hartford, CT 06110

Phone: 860-232-9990
Internet: www.RoseMill.com

2 HAZARDS IDENTIFICATION

Classification of Substance

GHS Classification in Accordance with 29 CFR 1910 (OSHA HCS):

Health, Reproductive toxicity, 2
Environmental, Hazards to the aquatic environment - Acute, 1
Environmental, Hazards to the aquatic environment - Chronic, 2

GHS Label Elements, Including Precautionary Statements

GHS Signal Word: WARNING

GHS Hazard Pictograms:

GHS Hazard Statements:

H361 - Suspected of damaging fertility or the unborn child (state specific effect if known)(state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects

GHS Precautionary Statements:

P202 - Do not handle until all safety precautions have been read and understood.
P273 - Avoid release to the environment.
P308 + P313 - IF exposed or concerned: Get medical advice/ attention.
P501 - Dispose of contents/container to ...

3 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Ingredients

CAS#	%	Chemical Name
138265-88-0	>98.8%	Dodecaboron Tetrazinc Docosaoxide Heptahydrate

4 FIRST AID MEASURES

Inhalation: If symptoms such as nose or throat irritation are observed, remove to fresh air.
Skin Contact: No treatment necessary.
Eye Contact: Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, seek medical

attention.

Ingestion: Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drinkl and seek medical attention

5 FIRE FIGHTING MEASURES

Flammability: The product is not flammable, combustible or explosive

Use extinguishing media that are appropriate to local circumstances and teh surrounding environment

6 ACCIDENTAL RELEASE MEASURES

For Non Emergency Personnel: Eye protection according to ANSI Z.87.1 or other national standards.
For Emergency Responders: Eye protection according to ANSI Z.87.1 or other national standards.

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 quality standards.

Methods and material for containment and cleaning up:
Appropriate containment: Avoid spillage into water and cover drains.
Land spill: Vacuum, shovel or sweep up and place in containers for disposal in accordance with applicable local regulations.
Spillage into water: Where possible, remove any intact containers from the water.

7 HANDLING AND STORAGE

Handling Precautions: Good housekeeping procedures should be followed to minimize dust generation and accumulation. Avoid spills. Do not eat, drink and smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

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

Storage temperature: Ambient
Storage pressure: Atmospheric
Special sensitivity: Moisture (caking)

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

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

Personal Protective Equipment: Eye and face protection: Eye protectionaccording to ANSI Z.87.1 or other national standards are warranted if environment is excessively dusty.
Skin protection: Standard work gloves (cotton, canvas or leather) may be warranted if environment is excessively dusty.
Respiratory protection: Where airborne concentrations are expected to exceed exposure limits, respirators should be used.

Control Parameters
Occupational exposure limit values: In the absenceof a national OEL, Rose Mill recommends and applies internally an Occupational Exposure Limit (OEL of 1 mg B/m^3. To convert product into equivalent zinc (Zn) content, multiply by 0.301. To convert product into equivalent boron (B) content, multiply by 0.149.

Occupational Exposure Limits:

OSHA/PEL (total dust)15 mg/m^3Particulate Not Otherwise Classified or Nuisance DustOSHA/PEL (respirable dust)5 mg/m^3Particulate Not Otherwise Classified or Nuisance DustCal OSHA/PEL5 mg/m^3Particulate Not Otherwise Classified or Nuisance Dust

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White powder		
Odor Threshold:	not applicable - odorless	**Odor:**	odorless
Specific Gravity or	2.6@ 20 degrees Celcius	**Molecular Formula:**	2ZnO.3B2O3.3.5H20

Density:			
Viscosity:	not applicable - solid substance	**Solubility:**	Water: <.28%@25 degrees Celcius
Boiling Point:	Not applicable	**Freezing or Melting Point:**	Phase change at 650 degrees Celcius
Flammability:	Non-flammable (used as a flame retardant)	**Flash Point:**	Not applicable - inorganic substance
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Potentia Hydrogenii:	6.8 - 7.5 (aqueous solution)	**Autoignition Temperature:**	Not applicable - not self-heating
Evaporation Rate:	Not applicable - non-volatile		
Molecular weight:	434.66		
Decompression Temperature:	Not applicable		

10 STABILITY AND REACTIVITY

Reactivity:	None Known
Chemical Stability:	Under normal ambient temperatures (-40c to + 40c) the product is stable
Conditions to Avoldentification:	Avoid contact with strong reducing agents by storing according to good industrial practice.
Materials to Avoldentification:	Strong reducing agents
Hazardous Decomposition:	None

11 TOXICOLOGICAL INFORMATION

Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact):
Inhalation is the most significant route of exposure in occupational and other settings. Dermalexposure is not usually a concern because product is poorly absorbed through intact skin. Product is not intended for ingestion.

(A) Acute Toxicity:
Method: Acute Oral Toxicity Study - OECD Guideline 401 equivalent
Species: Rat
Dose: 0.464; 1.00; 2.15; 4.64; 10.0 g/kg body weight of Zinc Borate 2335 in 50% w/v formulation in corn oil.
Routes of Exposure: Oral
Results: Low acute oral toxicity. LD50 in rats is >10,000 mg/kg bw (limit of tested dosages). Based on available data, the classification criteria are not met.

Method: Acute Dermal Toxicity Study
Species: Rabbit
Dose: 1.00; 2.15; 4.64; 10.0 g Zinc Borate 2335 kg bw.
Route of Exposure: Dermal
Results: Acute oral LD50 is >10,000 mg/kg (limit of tested dosages). Based on the available data, the classification criteria are not met.

Method: Acute Inhalation Toxicity Study - OECD Guideline 403
Species: Rat
Dose 4.95 mg/L of Zinc Borate 415
Routes of Exposure: Inhalation
Results: No acute inhalation tixicity data is available for Zinc borate, hydrate. LC50 value in rats for acute inhalation toxicity > 4.95 mg/L based on an acute toxicity study on similar zinc borate compound. Based on available data, the classification criteria are not met.

(B) Carcinogenicity:
No experimental test data on zinc borate
Results: Zinc borate disassociates to zinc hydroxide and boric acid in low pH environment of the stomach. No carcinogenic effects observed in chronic carcinogenicity studies of boric acid conduted in rats and mice, and no evidence of carcinogenic effects in zinc borate breakdown products. Based on available data, the classification criteria are not met.

(C) Reproductive Toxicity:
Method: 90-day Oral Toxicity Study - OECD 408
Species: Rat
Dose: 0, 50, 100, 200 and 375 mg zinc borate (hydrate)/kg/day
Routes of Exposure: Oral gavage
Results: NOAEL in rats for effects of fertility in males is 100 mg zinc borate (hydrate)/kg/bw

Method: Prenatal Developmental Toxicity Study - OECD Guideline 414
Species: Rat
Dose: 1, 100, 125 and 150 mg zinc borate (hydrate)/kg bw
Routes of Exposure: Oral gavage

Results: NOAEL in rats for developmental effects on the fetus including fetal weight loss and minor skeletal variations is < 100mg zinc borate hydrate/kg bw.
Classification: Reproductive Toxicity Category 2 (Hazard statement: H361d: Suspected of damaging the unborn child).

Summary of evaluation of the CMR properties:
Zinc borate is not mutagenic. No carcinogenicity studies with zinc borates are available, therefore no classification is possible. 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 conduted in rats and mice, and no evidence of carcinogenic effects in zinc borate breakdown products. 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 studies of high exposure 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.

Symptoms related to the physical, chemical and toxicological characteristics:
Not expected to be irritating to the eyes, nose, throat or skin in normal industrial use. Occasional mild irritation effects to the nose and throat may occur from inhalation of dust at levels greater than 10 Mg/m^3. Productrs containing zinc borate are not intended for ingestion. Zinc borate has a low acute toxicity. Small amounts (e.g. a teaspoon) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

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 to borate dust and indicate no effect to general population with high exposures to borates in the environment.

12 ECOLOGICAL INFORMATION

Ecotoxicity (aquatic and terrestrial, where available):
Data values are expressed as zinc ion or boron equivalents. To convert this product, divide the zinc equivalent by 0.301 and divide the boron equivalent by 0.149. Studies judged to be unrealiable or with insufficient information to evaluate are not included. All toxicity values are reported as added concentrations, i.e. with subtraction of the background concentration of zinc or boron in the test media.

Freshwater: Chronic Studies:

ZINC

13 DISPOSAL CONSIDERATIONS

Product packaging should be recycled where possible.
Local authorities should be consulted about any specific local requirements.

Such product should, if possible, be used for an appropriate application

Zinc borate has a reportable quantity (RQ) of 454 kg (1000 lbs).

14 TRANSPORT INFORMATION

UN3077, Environmentally hazardous substances, solid, n.o.s., 9, PGIII
Environmental Hazards: Marine Pollutant

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 I 71 .8). DOT rules apply when these products are transported in quantities equal to or exceeding the RQ (1000 lbs.) in a single package. U.S. DOT 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 lll, 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 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.

15 REGULATORY INFORMATION

Component (CAS#) [%] - CODES

Dodecaboron Tetrazinc Docosaoxide Heptahydrate (138265-88-0) [n/a%]

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

Clean Air Act (Montreal Protocol) - Substances that deplete the ozone layer: Not manufactured with and does not contain any Class I or Class ll ozone depleting substances.

NPRI (Canada): Zinc borate is not listed on the Canadian National Pollutant Release Inventory.

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

National Regulations: Ensure all national/local regulations are observed.

U.S. EPA RCRA: This oroduct is not listed as a hazardous waste under anv sections of the Resource Conservation and Recovery Act (RCRA) or regulations (40 CFR 261 et seq).

Superfund: CERCLA/SARA. This product is listed under CERCLA (Comprehensive Environmental Response Compensation and Liability Act) as a Hazardous Substance With a reportable quantity (Ra) of 1,000 lbs (5a 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 ChemicalslRelease-lnventory 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.

Safe Drinking Water Act (SDWA): This product is not regulated under the SDWA, 42 USC 300g-1, 40 CFR 141 et seq. Consult state and local regulations for possible water quality-advisories regarding boron compounds.

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) lt is on the Section 307 List of Priority Pollutants, 33 USC 1317,40 CFR 129.

c) lt is on the Section 31 1 List of Hazardous Substances, 33 USC 1321, 40 CFR 116.

IARC: The Intepational Agency for Research on Cancer (IARC) (a'unit of the World Health Organization) does not list or categorize this product as a carcinogen.

NTP Biennial Report on Carcinogens: This product is not listed.

OSHA carcinogen: This product is not listed.

Regulatory CODE Descriptions

California Proposition 65: This product is not listed on the Proposition 65 list of carcinogens or reproductive toxicants.

Chemical Inventory Listing: The listing is sometimes under the inventory numbers of teh anhydrous form of this inorganic salt.
US EPA TSCA Inventory:1332-07-6Canada DSL:1332-07-6EINECS:235-804-2Australia AICS:138265-88-0China IECSC:138265-88-0Japanese METI & ISHL:(1)-73New Zealand NZloC:138265-88-0Philippines PICCS:1332-07-6South Korea KECI:KE-18394Taiwan:138265-88-0

16 OTHER INFORMATION

Precautionary Phrases:
KEEP OUT OF REACH OF CHILDREN.
Do Not Ingest
Not for use in food, drugs or pesticides
Refer to Safety Data Sheet

National Fire Protection Assoc (NFPA) classification:
Health 0
Flammability 0
Reactivity 0

Hazardous Materials Information Systems (HMIS) classification:
Red: (Flammability) 0
Yellow: (Reactivity) 0
Blue: (Acute Health) 0*
*chronic effects