Safety Data Sheet

C-TEC ZB200 **MSDS No. 9920.8**

Date of Preparation: 6/11/98 Revision: 4/2/15

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: C-TEC ZB200
Synonym: Zinc metaborate
General Use: Flame retardant in plastics, rubber, and resins.
Manufacturer: Marshall Additive Technologies
Division of the R. J. Marshall Company
26776 W. 12 Mile Road
Southfield, MI 48034-7807
Phone: (248) 353-4100, Fax: (248) 948-6460

Emergency Phone: (800) 424-9300
Date Revised: 4/2/15
Prepared By: Stephanie Nichols

Section 2 - Hazards Identification

Classification of the chemical: Not hazardous in accordance with paragraph (d) of 1910.1200.
Signal word: None
Symbol: None
Hazard Statements: None
Precautionary Statements: None

Hazards not otherwise classified: Very toxic to aquatic life.

HMIS	
H	1
F	0
R	0
PPE†	E

†Sec. 8

Section 3 - Composition / Information on Ingredients

Ingredient Name	CAS Number	Percent by Weight
Zinc Borate	1332-07-6	Max 100

Section 4 - First Aid Measures

Description of necessary measures, subdivided according to the different routes of exposure:
Inhalation: If symptoms such as nose or throat irritation are observed, remove person to fresh air. No specific treatment is necessary.
Eye: Use eye wash or fresh water to clean the eyes. If irritation persists more than 30 minutes, seek medical attention.
Skin: Poorly absorbed through intact skin. No treatment is necessary because non-irritating. Wash the area with soap and water.
Ingestion: Give two glasses of water or milk to drink and seek medical attention.

Most important symptoms/effects, acute and delayed:
Inhalation: Accidental inhalation may cause light irritation to the respiratory system.
Eye: Can be a slight irritant, rarely causes redness.
Skin: Non-irritating.
Ingestion: Small amounts (teaspoon) swallowed accidently are not likely to cause effects. Swallowing amounts larger than a teaspoon may cause gastrointestinal symptoms.

Indication of immediate medical attention and special treatment needed: None

Section 5 - Fire-Fighting Measures

Suitable Extinguishing Media: This material is not combustible. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media: None
Unusual Fire or Explosion Hazards: None known.
Hazardous Combustion Products: None known.
Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.
Fire-Fighting Equipment: No specific fire-fighting procedures given.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures: Wear safety glasses when exposure is prolonged and concentration is high in the air.

Methods and materials for containment and cleaning up: Sweep up spillage and place into clean container. Avoid generation and spreading of dust. Flush with plenty of water to clean spillage area. Avoid release to natural watercourses. Wastewater must be disposed of in accordance with National and Local Regulations.

Section 7 - Handling and Storage

Precautions for safe handling: Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required. Avoid spilling, skin, and eye contact. Read and follow manufacturer's recommendations. Follow the principles of good occupational hygiene to control personal exposures.

Storage Requirements: Store in a cool, dry, well-ventilated area. Keep tightly closed. Avoid high humidity, sunlight exposure, temperatures under 23°F (-5°C) and over 104°F (40°C).

Shelf-Life: 12 months when stored in dry, well-ventilated areas.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls:

Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Respiratory Protection: Wear protective masks for long exposures and where concentrations are high in the air.

Protective Clothing/Equipment: Wear suitable protective gloves made of butyl rubber or nitrile if there is risk of skin contact. Wear approved safety glasses or goggles.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Exposure Limits:

Ingredient	Industry recommended TWA
Zinc Borate	5 mg/m^3

Note: For the purpose of reporting for Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40CFR372.0 maximum percent by weight Zinc content is 30.3.

Section 9 - Physical and Chemical Properties

Appearance and Odor: white powder
Odor: odorless
Odor Threshold: not applicable
pH: 7-8
Freezing/Melting Point: 1202°F (650°C) heated in closet space
Boiling Point: not applicable
Flash Point: not applicable
Flash Point Method: not applicable
Evaporation Rate: not applicable
Flammability: Non-flammable, not combustible.
Upper/lower flammability or explosive limits: not applicable

Vapor Pressure: negligible at 68°F (20°C)
Vapor Density (Air=1): not applicable
Relative density: 2.8
Water Solubility: <0.28% at 68°F (20°C)
Other Solubilities: soluble in acetone, ethylene glycol, glycerine, alcohols
Partition coefficient: n-octanol/water; <0.2, based on zinc
Auto-ignition Temperature: Not applicable.
Decomposition temperature: not applicable
Viscosity: not applicable

Section 10 - Stability and Reactivity

Reactivity: Reacts as a weak acid which may cause corrosion of base metals. Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas which could create an explosive hazard.

Chemical Stability: This product is stable at room temperature in closed containers under normal storage and handling conditions.

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: High temperatures and direct contact with fire or heat sources. Boric acid is a stable product, but when heated loses its water, first forming metaboric acid (HBO_2) and on further heating it is converted into boric oxide (B_2O_3).
Incompatible materials: Strong acids and bases. Strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas, which could create an explosive hazard.
Hazardous Decomposition Products: None

Section 11- Toxicological Information

Information on the likely routes of exposure:
Ingestion, inhalation, and through broken skin

Symptoms related to the physical, chemical and toxicological characteristics:
Ingestion: Can cause abdominal pains with sting, nausea, and vomit.
Inhalation: Inhalation of vapors causes irritation of the inferior and advanced respiratory system with cough and respiratory difficulty. At elevated concentrations, may also cause pulmonary edema.
Eye irritation: Non-irritant.
Skin irritation: Non-irritant

Delayed and immediate effects and also chronic effects from short- and long-term exposure: None known.

Numerical measures of toxicity:
Ingestion: LD_{50} rat 3500-4100 mg/kg
Inhalation: LC_{50} rat > 2 g/m^3
Eye: No data
Skin: LD_{50} rat >2000 mg/kg

Carcinogenicity: This product is not considered carcinogenic by OSHA, IARC, NTP, ACGIH.
Mutagenicity: No evidence found.
Reproductive toxicity: No effect on fertility.
Chronic toxicity: Extremely rare chronic poisonings can cause gastrointestinal symptoms.
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Section 12 - Ecological Information

Ecotoxicity: 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.
Fish: Seawater: Dab, Limanda limanda 96 hr LC_{50} = 74 mg B/L
Freshwater: Rainbow trout 96 hr LC_{50} = 2.4 mg Bzn/L
Invertebrate: Daphnids, Daphnia magna Straus 48 hr LC_{50} = 76 mg B/L
Based on the above acute and chronic ecotoxicity and solubility data, zinc borate should be classified as hazardous to the environment: Acute 1, Chronic 1 because:
After 7 days at a loading of 10 mg zinc borate/L (ph6 and 8) the amount of Zn ions in solution is higher than the L(E)C_{50} values for Zn (after correcting for molecular weight). L(E)C_{50} = 0.452 mg/l.
After 28 days at a loading of 1 mg zinc borate/L (ph6 and 8) the amount of Zn ions in solution is higher than the NOEC values for Zn (after correcting for molecular weight). M factor = 1.

Persistence and degradability: Boron is naturally occurring and ubiquitous in the environment. It will undergo hydroloysis in water to form boric acid and zinc hydroxide. Neither of these substances will biomagnify through the food chain.

Bioaccumulative potential: There is no bioaccumulation.

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

PBT evaluation results: Not persistent and not bioaccumulable.

Water hazard class: WGK 2.

Section 13 - Disposal Considerations

Disposal: Dispose of in accordance with local regulations. Do not disperse to city drain or water course. Small quantities of zinc borate 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.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101): US DOT Hazardous substance. RQ=1000 pounds. When transported in packages less than the reportable quantity (RQ), zinc borate is not a DOT Hazardous material.

UN No.: 3077

UN proper shipping name: Environmentally hazardous substance, Solid N.O.S.

Transport hazard classes:

Hazard Class (ADR): Class 9: Miscellaneous dangerous substance and articles.

ADR Class No.: 9 ADR Item No.: III Hazards No. (ADR): 90 ADR Label No.: 9

Signboard (ADR): All products classified R50 according to Dir. 67/548/CEE and following amendments or according Dir. 1999/45/CE beginning 1/7/05 are classified in class 9 and signed with Kemler n° 90 and ONU n° 3077. Beginning 1/1/11 it is necessary to put the Environmental pictogram beside the class 9 pictogram.

DOT requirements:

Special Provisions: 8, 146, B54, IB8, N20	Passenger Air/Rail Limit: None
Packaging Exceptions: 155	Air Cargo Limit: None
Non-Bulk Packaging: 213	Vessel Stowage: A
Bulk Packaging: 240	Other Stowage: N/A

TDG Canadian Transportation: Listed as Zinc Borate 9.2 NA9155 Packing Group III. Regulated Limited of 50kg.

Packing group: III

Environmental hazards: Marine pollutant: yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: not determined

Special precautions: Very toxic to aquatic life.

Tariff/Commodity Code: 2840.20

Section 15 - Regulatory Information

EPA Regulations:

RCRA Hazardous Waste Number (40 CFR 261.33): Not listed
RCRA Hazardous Waste Classification: Not classified
CERCLA Hazardous Substance (40 CFR 302.4) Listed RQ: 1000# (454kg)
SARA Toxic Chemical (40 CFR 372.65): Not listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed
CWA Hazardous Substances- 1000# RQ
Zinc or Zinc Compounds are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.0.

OSHA Regulations:

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Not listed

TSCA

This substance is on the Chemical Substances Inventory of the Toxic Substance Control Act (TSCA Inventory [USA]). Please note that this product is not subject to any legal reporting requirements under these acts.

INTERNATIONAL REGULATIONS

Canada: Listed on DSL.
WHMIS: Uncontrolled product according to WHMIS classification criteria.
Europe: Listed on EINECS #215-566-6.
Listed on the Inventory of Cosmetic Ingredients Directive (INCI) (76/768/EEC)-Other Ingredients.
Listed on EC Directive 67/548/EC as Dangerous for the Environment.
Australia: Listed on AICS.
China: Listed on IECSC.
Japan: Listed on ENCS.
Korea: Listed on ECL #KE-03516.
New Zealand: Listed on NZIoC.
Philippines: Listed on PICCS.
Taiwan: Listed on NECI.

Section 16 - Other Information

Prepared By: Stephanie Nichols
Revision Notes: 4/2/15

Product Grades Available from the R. J. Marshall Company (this list may be incomplete):

CTZB200

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