ZINC BORATE

According to Reg.EC n° 1907/2006 (REACH) , Reg. EC n° 1278/2006 (CLP), Reg.EC n° 790/2009 and Reg. EU 830/2015 ,OSHA, 29 CFR 1910.1200 - Appendix D (GHS)

Safety Data Sheet : Revision n. 26 - August 2020 (First Emission: January 1994)

1.IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 Product identifier

- Commercial Name: ZINFLAM ZB
- Other commercial names: ZINFLAM ZB, FINE, EXTRA FINE, HP, HP Li, S.
- Chemical Formula: $Zn_4B_{12}O_{22}*7H_20$
- Chemical Name/synonyms: Zinc Borate Hydrate, hexaboron dizinc undecaoxide, DodecaBoron Tetrazinc docosaoxide;
- Chemical Family: Inorganic Borates
- REACH registration N°: 01-2119691658-19-0001
- CAS registry N°:138265-88-0 (Anhydrous CAS N°:12767-90-7)
- EINECS N°: 235-804-2

1.2 Relevant identified uses of the substance and uses advised against

Formulation into Mixtures or Materials, Industrial Use or Formulations containing Zinc Borate, Fertilizers containing Zinc Borate, Zinc Borate in Plastics during Service Life, Use of Zinc Borate in Lubricants in Cars, Consumer Use of Formulated Products and Materials containing Zinc Borate.

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

Uses advised against: Consumer uses above the concentration limit.

1.3 Details of the supplier of the safety data sheet

SCL Italia spa

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

http://www.larderellogroup.com

e-mail : mosca@larderellogroup.com

1.4 Emergency telephone number

- USA and Canada:
  +1 202 464 2554 (contract n°:SCLITALIA29003- NCEC)
- Centro antiveleni di Milano - Ospedale Niguarda Ca' Granda
  tel.+39 02-66101029
- **SCL Italia spa**: +39-0588-668817 (8:00 -17:00 – Mon-Fry)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

Very toxic to aquatic life. Toxic to aquatic life with long-lasting effects. Suspected of damaging the unborn child (Cat.2, H361d ; Acute Tox 1 , H400;Chronic 2,H411; according Reg.(EC) n 1272/2008 – CLP according OSHA, 29 CFR 1910.1200 and GHS)

2.2 Label elements (according Reg.(EC) n 1272/2008 - CLP according OSHA, 29 CFR 1910.1200 and GHS)

SCL Italia spa

Headquarter: Via F. Filzi 25/A - 20124 Milano, ITALY Tel. 02/67716820

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

2.3 Other hazards

- Environment: Very toxic to aquatic life, with long lasting effect.Therefore releases to the environment should be minimised. (See sec. 12)
- PBT or vPvB: substance is not PBT or vPvB

(GHS09) (GHS08)

Warning

Acute Tox 1 , H400 Cat.2, H361d

Chronic 2, H411

P201,P202,P273, P280,P281,P308+P313,P391,405,501

Element ID	N° EINECS	N° CAS
Zinc Borate	235-804-2	138265-88-0

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical Name	Conc. (%)	N° EINECS	N° CAS	Category	Hazard statement
hexaboron dizinc undecaoxide	> 99.9	235-804-2*	138265-88-0	Aquatic Acute 1	H400
				Aquatic Chronic 2	H411
				ReproTox. Cat. 2	H361d

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

Concentration limits: Zinc Borate has no a specific concentration limit , so if it is used in mixtures and C ≥ 3 % the final mixture has to be classified as Toxic to Reproduction , Categ. 2, H361d.

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 also Section 11).

4.3 Indication of any immediate medical attention and special treatment needed

Note to physicians: Observation only is required for adult ingestion of a few grams of anhydrous zinc borate. For ingestion in excess of a few grams, maintain adequate kidney function and force fluids.

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. The product is used as a flame retardant.

6 ACCIDENTAL RELEASE MEASURES

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 and causes 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.

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".
- 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 .

7.3 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 exposure limit values, **SCL Italia spa** recommends and applies an internal occupational exposure limit 2 mg/m^3.

- OELs for zinc oxide

Country	8 hour-TWA mg/m^3	15 min-STEL mg/m^3	References
USA	2(dust)	10 (dust)	ACGIH (2001)
The Netherlands	5 (fumes)		SZW (1997)
Germany	5 (fumes) 6 (dust)		DFG (1997)
UK	5 (fumes) 10 (dust)		HSE (1998)
Sweden	5 (fumes)		National Board of Occupational Safety and Health, Sweden (1993)
Denmark	4 (fumes) 10 (dust)		Arbejdstilsynet (1992)

- DNELs workers:

Route of exposure	Acute Local Effects	Acute Systemic Effects	Local Chronic Effects	long-term systemic Effects
Oral	No prescription or requirements			
Inhalation	*	*	*	22.4 mg/m^3
Dermal	*	*	*	1585 mg/kg bw/day

- DNELs General Population:

Route of exposure	Acute Local Effects	Acute Systemic Effects	Local Chronic Effects	long-term systemic Effects
Oral	*	*	*	2.4 mg/kg bw/day
Inhalation	*	*	*	8.3 mg/m^3
Dermal	*	*	*	1205 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

- PNECs

Environment	PNEC
Fresh water	2.9 mg B/L
Marine water	2.9 mg B/L
Intermittent releases	13.7 mg/L
air	No exposure of expected
soil	5.7 mg/kg soil dw
sediment (fresh water)	No exposure of sediment expected

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

(a) 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.

(b) Respiratory protection: Wear protective masks (class FFP3) for long exposures and high concentration levels

(c) Eye protection: Wear security glasses for long exposures and high concentration levels .

(d) 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 an 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 PHISICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- Appearance: White crystalline solid (powder);
- Odour: Odourless
- Olfactory threshold: N.A.
- pH at 20°C:
  Concentration 1 g/L= 6.8
- 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: 2,8 g/cm3 at 20°C
- Water solubility at 20 °C < 0,1%
- Solubility: soluble in acetone, ethylene glycol, glycerine, alcohols
- Partition coefficient octanol/water < 0.2, based on zinc
- Viscosity :N.D.

9.2 Other Informations

- Does not contain organic solvents
- No oxidising
- Melting point: > 300°C
- Specific gravity (20°C) : 2,8
- Molecular weight : 434,7

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).

10.3 Possibility of hazardous reactions

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

According to currently available data, this product has not yet produced health damages. Anyway, it must be handled carefully according to good industrial practices.

- Means of exposure: ingestion, inhalation and trough not intact skin
- Corrosiveness/Irritant properties: slightly irritant to eyes and first respiratory system
- Acute toxicity
  - Ingestion : Low acute oral toxicity; The ingestion can provoke disturbs to the health, that they comprise abdominal pains with sting, nausea and vomit; LD50 (rat) > 5000 mg/kg.
  - Inhalation : Low acute inhalation toxicity ; The inhalation of vapours causes irritation of the inferior and advanced respiratory system with cough and respiratory difficulty; at elevated concentrations may cause also edema pulmonary. LC50 (rat) > 4.95 mg/L air
  - Eye irritation: Non-irritant.
  - Skin irritation: non-irritant. LD50(Rat) > 5000 mg/kg bw
- Chronic toxicity: Extremely rare chronic poisonings can cause gastrointestinal symptoms
- Sensitising properties: No evidence found
- Carcinogenicity: No evidence found.
- Mutagenicity: No evidence found.
- Reproductive toxicity

Based on the results of the conducted studies on animals (oral administration of zinc borate 2335 to rats for a minimum of 90 consecutive days) the no-observed-adverse-effect level (NOAEL) was 100 mg/kg/day for males and 375 mg/kg/day for females. For Zinc Borate a No-Observed-Adverse-Effect-Level was determined in this OECD 414 study. A NOAEL of 150 mg/kg bw was established for the parental females and a NOAEL of 100 mg/kg bw was established for developmental toxicity.

12 ECOLOGICAL INFORMATIONS

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 0.1748. 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.

Invertebrate toxicity

Daphnids, **Daphnia magna** Straus

48-hr LC_{50} = 76 mg B/L

Fish toxicity

Sea water:

Dab, **Limanda limanda** 96-hr LC_{50} = 74 mg B/L

Fresh water:

Rainbow trout,

96-hr LC50 = 2.4 mg Bzn/L

Based on the above acute and chronic ecotoxicity and solubility data, zinc borate should be classified as hazardous to the environment Acute 1 and Chronic 2 , 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)C50 values for Zn (after correcting for molecular weight) . L(E)C50 = 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

12.2 Persistence and degradability

Boron is naturally occurring and ubiquitous in the environment. ZB will undergo hydrolysis in water to form boric acid and zinc hydroxide. Neither of these substances will biomagnify through the food-chain.

12.3 Bioaccumulative potential

there is no bioaccumulation

12.4 Mobility in Soil

Nutriment 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

Germany only - WGK (Wassergefährdungsklassen)

Based on the current German legislation the scores for Zinc Borate are :

H361d : 2
H400 : 6
H411 : 6

→ WGK : 3

13 DISPOSAL CONSIDERATIONS

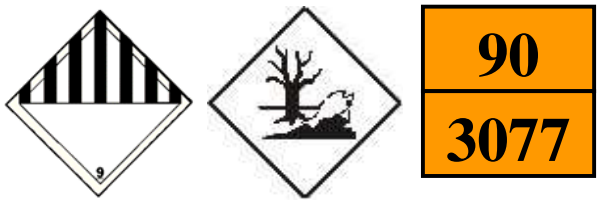
13.1 Waste treatment methods

This product is classified as toxic to reproduction and to the environment (H361d , H400,H411) and and falls within scope of Reg. 1357/2014 as hazardous waste (HP10,HP14). 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 INFORMATIONS

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



14.1 UN Number: UN 3077

14.2 UN Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (zinc borate)

14.3 Transport hazard class(es): 9

14.4 Packing Group: III

14.5 Environmental Hazards: MARINE POLLUTANT

14.6 Special precautions for user: Not Regulated

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

14.8 EmS Code IMDG: F-A, S-F

summary

Complete indications for the shipment	**UN 3077** Material dangerous to the environment, **solid, N.O.S.,(Zinc Borate) 9, III**
Class	**9**
UN n°	**3077**
Packaging group	**III**
Danger Label	**9**
Material dangerous to the environment?	**Yes**
Kemler n°	**90**
Transport category	**3**
Tunnel restrictions	**(-)**

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

This SDS is in conformance with Reg. CE n° 1907/2006 (REACH) , Reg.CE n°453/2010, Reg.CE n° 790/2009 and according OSHA, 29 CFR 1910.1200 and GHS

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

- 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 12767-90-7
- Canadian DSL 12767-90-7
- EINECS 235-804-2

- For U.S. market only

NFPA Hazard Ratings: Health 0 Flammability 0 Reactivity 0

HMIS Hazard Ratings: Red: (Flammability) 0 Yellow: (Reactivity) 0

Blue: (Acute Health) 0* *Chronic Effects

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

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 CSE. Please ask for an electronic copy to info@larderellogroup.com

16 OTHER INFORMATIONS

16.1 MEANING OF ASSIGNED "H" SENTENCES :

Hazard statement

H400: Very toxic to aquatic life;

H411: Toxic to aquatic life with long-lasting effects

H361d: Suspected of damaging the unborn child

16.2 MEANING OF ASSIGNED "P" SENTENCES

Precautionary Statement Prevention

P201 : Obtain special instructions before use

P202 : Do not handle until all safety precautions have been read and understood.

P273: Avoid release to the environment.

P280 : Wear protective gloves/protective clothing/eye protection/face protection.

P281 : Use personal protective equipment as required.

P308+313: If exposed or concerned , get medical advice/attention.

P391: Collect spillage.

P405 : Store locked up.

P501: Dispose of contents/container in accordance with local regulation.

16.3 TRAINING ADVICE :

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

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 Conentration

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.

SCL Italia spa assumes no responsibility for damages to persons or goods resulting from the incorrect handling of this product.