

## Material Safety Data Sheet

### BORAX DECAHYDRATE

#### Section 1 - Product Identification

Synonyms : Sodium tetraborate decahydrate, disodium tetraborate, borax  
Molecular Weight : 381.37g/mol  
Chemical Formula :  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$   
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Recommended use of the chemical and restrictions on use

The product is used in industrial manufacturing, in particular in :

- Ceramics
- Detergent
- Borosilicate glass
- Insulation fiberglass

#### Section 2 – Composition/Information on Ingredients

The product contains greater than 99.9 percent (%) borax decahydrate  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$

Chemical Name	EC No/CAS No	Purity, %
Borax Decahydrate (Sodium tetraborate decahydrate, disodium tetraborate, borax)	215-540-4 1303-96-4	min. 99.9

#### Section 3 – Hazards Identification

##### 3.1 Classification of the substance according to GHS

Reproductive toxicant, Category 2

H 361d : Suspected of damaging the unborn child



Eye irritant 2A

H319: Causes serious eye irritation.

## Acute Oral 5

H303: May be harmful if swallowed.

### 3.2. GHS Label elements, including precautionary statements

 Warning H 361d: Suspected of damaging the unborn child. H303: May be harmful if swallowed.	 Warning H319: Causes serious eye irritation.
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P201: Obtain special instructions before use.

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

P264: Wash eyes thoroughly after handling.

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

P308 + P313: If exposed or concerned: get medical advice/attention.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337+P313: If eye irritation persists: Get medical advice/attention.

P312: Call a POISON CENTER/doctor/physician if you feel unwell

P405 : Store locked up.

### 3.3. Other hazards which do not result in classification

Borax decahydrate is a white odourless, powdered substance that is not flammable, combustible, or explosive, and has low acute oral and dermal toxicity.

#### Potential health effects

Inhalation is the most significant route of exposure in occupational and other settings. Dermal exposure is not usually a concern because borax decahydrate is poorly absorbed through intact skin.

#### Inhalation

Occasional mild irritation effects to nose and throat may occur from inhalation of borax decahydrate dusts at levels higher than 10 mg/m<sup>3</sup>.

#### Eye contact

Borax decahydrate is a serious eye irritant.

#### Skin contact

Borax decahydrate does not cause irritation to intact skin.

#### Ingestion

Products containing borax decahydrate are not intended for ingestion. Borax decahydrate has low acute toxicity. Small amounts (e.g. a teaspoonful) swallowed accidentally are not likely to cause effects; swallowing amounts larger than that may cause gastrointestinal symptoms.

#### **Potential ecological effects**

Large amounts of borax decahydrate can be harmful to plants and other species. Therefore releases to the environment should be minimised.

#### **Signs and symptoms of exposure**

Symptoms of accidental over-exposure to borax decahydrate have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhoea, with delayed effects of skin redness and peeling.

Refer to section 11 for details on Toxicological data.

### **Section 4 – First-Aid Measures**

#### **4.1. Description of first aid measures**

##### **Skin contact**

No treatment necessary because non-irritating.

##### **Eye contact**

Use eye wash fountain or fresh water to cleanse 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.

##### **Ingestion**

If large amounts are swallowed (i.e. more than one teaspoon), contact a doctor or toxicity centre immediately.

##### **Note to physicians**

Observation only is required for adult ingestion of less than 9 grams of borax decahydrate. For ingestion in excess of 9 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Haemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment[1] (see section 11).

#### **4.2. Most important symptoms and effects, both acute and delayed**

N.A.

#### **4.3. Indication of any immediate medical attention and special treatment needed**

N.A.

## Section 5 – Fire Fighting Measures

### 5.1. Suitable Extinguishing media

Any fire extinguishing media may be used on nearby fires.

### 5.2. Specific hazards arising from the chemical

Borax decahydrate is not flammable, combustable or explosive. The product is itself a flame retardant.

### 5.3. Special protective actions for fire-fighters

N.A.

## Section 6 – Accidental Release Measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation. In case of exposure to prolonged or high level of airborne dust, wear a personal respirator in compliance with national legislation.

### 6.2. Environmental precautions

Borax decahydrate is a water-soluble white powder that may, at high concentrations cause damage to trees or vegetation by root absorption (see section 12).

### 6.3. Methods and material for containment and cleaning up

#### Land spill)

Vacuum, shovel or sweep up borax decahydrate and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during clean up and disposal. No personal protective equipment is needed to clean up land spills.

#### Spillage into water

Where possible, remove any intact containers from the water. 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 (see sections 12, 13 and 15).

## Section 7 – Handling and Storage

### 7.1. Precautions for safe Handling

To maintain package integrity and to minimise caking of the product, bags should be handled on a first-in firstout basis. Good housekeeping and dust prevention procedures should be followed to minimise dust generation and accumulation. Your supplier can advise you on safe handling, please contact the supplier.

The product should be kept away from strong reducing agents. Apply above handling advice when mixing with other substances.

### 7.2. Conditions for safe storage, including any incompatibilities

No special handling precautions are required, but dry, indoor storage is recommended. No specific requirements. Provide appropriate ventilation and store bags such as to prevent any accidental damage.

## Section 8 – Exposure Controls/Personal Protection

### 8.1. Control parameters

Occupational exposure limits for dust (total and respirable). are treated by OSHA, Cal OSHA and ACGIH as “Particulate Not Otherwise Classified” or “Nuisance Dust”

ACGIH/TLV 10 mg/m<sup>3</sup>

Cal OSHA/PEL 10 mg/m<sup>3</sup>

OSHA/PEL (total dust) 15 mg/m<sup>3</sup>

OSHA/PEL (respirable dust) 5 mg/m<sup>3</sup>

### 8.2. Appropriate engineering controls

Maintain air concentrations below occupational exposure standards.

Use local exhaust ventilation to keep airborne concentrations of borax decahydrate dust below permissible exposure levels. Wash hands before breaks and at the end of the workday. Remove and wash soiled clothing.

### 8.3. Individual protection measures, such as personal protective equipment (PPE)

#### Respiratory protection

In case of prolonged exposure to dust wear a personal respirator in compliance with national legislation (make reference to the appropriate CEN standard)

#### Eyes and hands protection

Goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

## Section 9 – Physical and Chemical Properties

### 9.1. Information on basic physical and chemical properties

Appearance : white solid, granular/powder

Odour : odourless

Odour threshold : N.A.

pH @ 20°C : 9.3 (0.1 % solution)

9.2 (1.0% solution)

9.3 (4.7 % solution)

Melting point : 741°C

Boiling point : 1575 °C

Flash point : Non flammable

Evaporation rate : N.A.

Flammability : N.A.

Upper/lower flammability or explosive limits : Non explosive

Vapour pressure : Negligible @ 20°C

Vapour density : N.A.

Relative density : 1.72 @ 20°C

Solubility in water : 4.7% @ 20°C; 65.6% @ 100°C

Partition coefficient: n-octanol/water : N.A

Auto-ignition temperature : N.A.

Decomposition temperature : 8H<sub>2</sub>O @ 60°C & -10H<sub>2</sub>O @ 320°C

Viscosity : N.A.

## 9.2. Other information

Molecular weight : 381.37

Specific gravity : 1.71 @ 20°C

## Section 10 – Stability and Reactivity

### 10.1. Reactivity

N.A.

### 10.2. Chemical stability

Borax decahydrate is a stable product, but when heated it loses water eventually forming anhydrous borax (Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub>).

### 10.3. Possibility of hazardous reactions

Reaction with strong reducing agents such as metal hydrides, acetic anhydride or alkali metals will generate hydrogen gas which could create an explosive hazard.

### 10.4. Conditions to avoid:

N.A.

### 10.5. Incompatible materials

Avoid contact with strong reducing agents such as metal hydrides, acetic anhydride or alkali metals.

### 10.6. Hazardous decomposition products

N.A.

## Section 11 – Toxicological Information

## 11.1. Information on toxicological effect

### 11.1.1. Substances

#### Acute toxicity<sup>(2)</sup>

Low acute oral toxicity; LD50 in rats > 2500 mg/kg of body weight. Test material: Disodium tetraborate anhydrous (Denton, S M., 1996)

#### Skin corrosion / irritation

Low acute dermal toxicity; LD50 in rabbits is greater than 2,000 mg/kg of body weight. Borax decahydrate is poorly absorbed through intact skin. Non-irritant<sup>(2)</sup>.

#### Serious eye damage/ irritation

Borax decahydrate is a serious eye irritant.

#### Respiratory or skin sensitization

Borax decahydrate is not a skin sensitizer.

#### Germcell mutagenicity

Borax decahydrate is not mutagenic.

#### Carcinogenicity

Borax decahydrate is not carcinogenic

#### Reproductive toxicity

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes<sup>(2)</sup>. Studies with the chemically related boric acid in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the foetus including foetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to <sup>[3,4,5]</sup>. Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility <sup>(6,7,8)</sup>.

#### STOT-single exposure

N.A.

#### STOT-repeated exposure

N.A.

#### Aspiration Hazard

Borax decahydrate has no aspiration hazard.

## Section 12 – Ecological Information

## 12.1. Toxicity

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.

### Phytotoxicity

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 minimise the amount of borate product released to the environment.

### Algal toxicity<sup>(9)</sup>

Green algae, *Pseudokirchneriella subcapitata* (Hansveit and Oldersma, 2000)

72-hr EC<sub>50</sub> –biomass = 40 mg B/L, or 353 mg disodium tetraborate decahydrate/L

### Invertebrate toxicity<sup>(10)</sup>

Daphnia, Daphnids, *Daphnia magna* (Gersich, 1984a)

48-hr LC<sub>50</sub> = 133 mg B/L or 1,173 mg disodium tetraborate decahydrate/L

### Fish toxicity<sup>(11)</sup>

Fish, Fatherted minnow, *Pimephales promelas* (Soucek et al., 2010)

96-hr LC<sub>50</sub> = 79.7 mg B/L or 703 mg disodium tetraborate decahydrate/L

## 12.2. Persistence and degradability

Boron is naturally occurring and ubiquitous in the environment. Borax decahydrate decomposes in the environment to natural borate.

## 12.3. Bioaccumulative potential

Not significantly bioaccumulative.

## 12.4. Mobility in soil

The product is soluble in water and is leachable through normal soil.

## Section 13 – Disposal Considerations

### 13.1. Disposal methods

Small quantities of Borax decahydrate can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be used for an appropriate application.

## Section 14 – Transport Information



Borax decahydrate has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

14.1. UN number : N.A.

14.2. UN proper shipping name : N.A

14.3. Transport of hazard classes : N.A

14.4. Packing group : N.A

14.5. Environmental hazards : N.A.

14.6. Special precautions for user : N.A

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: N.A.

## Section 15 – Regulatory Information

### 15.1. Safety, health and environmental regulations

It should be noted that borates are safe under conditions of normal handling and use, besides, they are essential nutrients to plants, and research shows that they play a beneficial role in human health. CLP classification has been solely based on animal tests where animals were exposed to high doses of boric acid over long periods of time. These doses were many times higher than humans are exposed to under conditions of normal handling and use. Consequently, a precautionary decision was taken by the European Commission. Although we will comply with the body of legislation triggered by that decision, we are in process of all possible legal actions.

#### Clean Air Act (Montreal Protocol)

Borax decahydrate was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

#### Chemical inventory listing

U.S. EPA TSCA Inventory	1303-96-4
Canadian DSL	1303-96-4
EINECS	215-540-4
South Korea	9212-848
Japanese MITI	(1)-69

Ensure all national/local regulations are observed.

## Section 16 : Additional Information

### 16.1. Mainly changes made to the previous version of this Material Safety Data Sheet (MSDS):

- This MSDS complies with ISO 11014; the requirements of UN-GHS

Revision No	Revision content
05	<ul style="list-style-type: none"><li>• This SDS is updated in accordance with the GHS (Rev.6) (2015)-Guidance on the Compilation of Safety data Sheets.</li><li>• This SDS is updated in line with Eti Maden Corporate identity.</li></ul>

## 16.2. List of abbreviation and acronyms used in this MSDS

**SDS** : Safety Data Sheets

**Index N°** : atomic number of the element most characteristic of the properties of the substance

**CAS No** : Chemical Abstracts Service number

**EC No** : EINECS Number : European Inventory of Existing Commercial Substances

**Repr. Cat. 2** : Substance presumed human reproductive toxicant

**Acute Oral Cat. 5** : Substance which is of relatively low acute oral toxicity.

**GHS** : Globally Harmonised System of Classification and Labelling

**LD<sub>50</sub>** : Median Lethal Dose

**LC<sub>50</sub>** : Lethal Concentration, 50%

**N.A.** : Not Applicable

**OSHA** : Occupational Safety & Health Administration

**Cal OSHA** : The State of California Division of Occupational Safety and Health (DOSH)

**PEL** : Permissible Exposure Limits

**ACGIH** : American Conference of Governmental Industrial Hygienists

**TLV** : Threshold Limit Value

**Japanese MITI** : Japanese Ministry of International Trade and Industry

**EC<sub>50</sub>** : Half maximal effective concentration

**UN** : United Nations

**U.S. EPA TSCA Inventory**: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the authority of the Environmental Protection Agency

**Canadian DSL**: Canadian Domestic Substances List

## 16.3. List of relevant hazard statements and precautionary statements used in this MSDS

### Hazard Statement

**H361 d**: Suspected of damaging the unborn child

**H319**: Causes serious eye irritation

**H303:** May be harmful if swallowed

## **Precautionary Statements**

### **Prevention**

**P201:** Obtain special instructions before use.

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

**P281:** Use personal protective equipment as required.

**P264:** Wash eyes thoroughly after handling.

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

### **Response**

**P308 + P313:** If exposed or concerned: get medical advice/attention.

**P305+P351+P338:** IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

**P337+P313:** If eye irritation persists: Get medical advice/attention.

### **Storage**

**P405:** Store locked up.

### **Disposal**

**P501:** Dispose of contents/container to in accordance with local regulations.

## **16.4. 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. Denton SM (1996). Acute oral toxicity study in the rat: anhydrous boric acid. Final report. Report no.: 1341/7-1032.
3. National Toxicology Program (NTP) – Technical Report Series No. TR324, NIH Publication No. 88 2580 (1987), PB88 213475/XAB
4. Fail et al., Fund. Appl. Toxicol. (1991) 17, 225-239
5. Heindel et al., Fund. Appl. Toxicol. (1992) 18, 266-277
6. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085
7. Scialli AR, Bonde JP, Brüske-Hohlfeld I, Culver D, Li Y, Sullivan FM; ELSEVIER 2009
8. Robbins WA, Xun L, Jia J, Kennedy N, Elashoff DA, Ping L. ;ELSEVIER 2009;(Reproductive Toxicology)
9. Hansveit and Oldersma, 2000; TNO Nutrition and Food Research Institute. Report No. V99.157.
10. Gersich, FM (1984a). Environ.Toxicol.Chem., 3 #1, 89-94 (1984)
11. Soucek et al., 2010. Illinois Natural History Survey, University of Illinois.

For general information on the toxicology of borates see ECETOC Technical Report No. 63 (1995); Patty's Industrial Hygiene and Toxicology, 4th Edition Vol. II, (1994) Chap. 42, 'Boron'.

### **16.5. Disclaimer of Liability**

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