

## BORAX DECAHYDRATE SAFETY DATA SHEET

### SECTION 1. Identification of the Substance

#### 1.1. Product identifier

Disodium tetraborate decahydrate

Index N° : 005-011-01-1

CAS N° : 1303-96-4

EC N° : 215-540-4

REACH Registration number: 01-2119490790-32-0002

Trade names: Borax Decahydrate

Chemical name/synonyms: Sodium tetraborate decahydrate, disodium tetraborate, borax

#### 1.2. Use of the substance

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

- Ceramics
- Detergent
- Borosilicate glass
- Insulation fiberglass

### SECTION 2. Hazard Identification

#### 2.1. Classification of the substance

##### 2.1.1. According to Regulation EC N°1272/2008 (CLP):

###### a. Harmonised classification provided in the 1<sup>st</sup> ATP to CLP (Regulation EC n°790/2009)

Repr. Cat. 1B; H360FD

Specific concentrations limits: Repr. 1B; H360FD: C ≥8.5%

###### b. Self-classification based on the classification criteria provided in CLP

Eye irrit. Cat. 2; H319

Specific concentrations limits: C ≥ 10.0 % Xi; H319

Precautionary Statement Prevention: P201; P202; P264, P280

Precautionary Statement Response: P308 + P313; P305+P351+P338; P337+P313

Precautionary Statement Storage: P405

Precautionary Statement Disposal: P501

##### 2.1.3. Additional information

For Full text of R-S phrases as well as Hazard Class/Statements and Precautionary Statements see section 16.

#### 2.2. Label elements

##### 2.2.1. According to CLP

Disodium tetraborate decahydrate

CAS N° 1303-96-4

EC N° 215-540-4

## Hazard pictograms:



**Signal word:** Danger

## Hazard Statements:

H 360FD : May damage fertility or the unborn child.  
H 319 : Causes serious eye irritation.

## Precautionary Statements:

P201 : Obtain special instruction before use  
P202 : Do not handle until all safety precautions have been read and understood  
P280 : Wear protective gloves/protective clothing/eye protection/face protection.  
P305+P351+P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P308+P313 : IF exposed or concerned: Get medical advice/attention  
P405 : Store locked up.

### 2.2.2. According to REACH, Annex XVII

Restricted to professional users

## 2.3. Other hazards

### Emergency overview

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>. Borax decahydrate has low acute inhalation toxicity

### Eye contact

Borax decahydrate is a serious eye irritant.

### Skin contact

Borax decahydrate does not cause irritation to intact skin since it has low acute dermal toxicity

### 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.

### Reproductive/Developmental

Animal ingestion studies in several species, at high doses, indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction. A recent epidemiological study and a peer reviewing report of the past epidemiological studies conducted in China didn't show any negative effect of boron on human fertility (10,11).

## 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 (see section 11).

## SECTION 3. Composition / Information on Ingredients

### 3.1. Substances

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 N° CAS N°	Registration Number	Purity	Hazard Statement (CLP)
Borax decahydrate	215-540-4 1303-96-4	01-2119490790-32-0002	99.9 %	H360FDH319

For other "Chemical inventory listing", please refer to section 15.

## SECTION 4. First aid measures

### 4.1. Description of first aid measures

#### Skin contact

No treatment necessary because borax decahydrate has low acute dermal toxicity.

#### Eye contact

Borax decahydrate is a serious eye irritant. 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. Borax decahydrate has low acute inhalation toxicity

#### Ingestion

If large amounts are swallowed (i.e. more than one teaspoon), attempt to induce vomiting if the subject is completely conscious and if the product does not come in the form of a solution in organic solvents and 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<sup>[1]</sup> (see section 11).

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

N.A. (Not Applicable)

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

N.A.

## SECTION 5. Fire-fighting measures

### 5.1. Extinguishing media

Any fire extinguishing media may be used on nearby fires.

### 5.2. Special hazards arising from the substance

None. Borax decahydrate is not flammable, combustible or explosive. The product is itself a flame retardant.

### 5.3. Advise for firefighters

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).

### 6.4. Reference to other sections

See Sections 8 and 13 for further information.

## 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 first-out 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.

### 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.

### 7.3. Specific end use(s)

The product should be kept away from strong reducing agents.  
See exposure scenario in Annex to the SDS.

## SECTION 8. Exposure controls / Personal protection

### 8.1. Control parameters

#### *Occupational Exposure Limit Values*

Substance:	Disodium tetraborate, decahydrate			
CAS No:	1303-96-4			
	Limit value-Eight hours		Limit value – Short term	
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Belgium		2		6
Canada - Québec		5		
Denmark		2		4
France		5		
Germany (DFG)		0.75 inhalable aerosol (1)		0.75 inhalable aerosol (1,2)
Poland		0.5		2
Spain		5		
Sweden		2		5
Switzerland		5 inhalable aerosol		5 inhalable aerosol
USA - NIOSH		5		
United Kingdom		5		

Source: IFA Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung

#### Remarks

- (1) calculated as boron
- (2) 15 minutes average value.

Respect regulatory provisions for dust (total and respirable).

- *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>

## DNELs values

Exposure pattern	Type/site of effect	Exposure route	DNEL value
<b>DNELs for workers</b>			
Acute	Local	Inhalation	22.3 mg/m <sup>3</sup>
Long-term	Systemic	Inhalation	12.8 mg/m <sup>3</sup>
Long-term	Systemic	Dermal	42478 mg/day
<b>DNELs for the general public</b>			
Acute	Systemic	Oral	1.5 mg/kg bw/day
Acute	Local	Inhalation	22.3 mg/m <sup>3</sup>
Long-term	Systemic	Dermal (external)	303.5 mg/kg bw/day
Long-term	Systemic	Dermal (systemic)	1.5 mg/kg bw/day
Long-term	Systemic	Inhalation	6.5 mg/m <sup>3</sup>
Long-term	Systemic	Oral	1.5 mg/kg bw/day
Long-term	Local	Inhalation	22.3 mg/m <sup>3</sup>

Source: Chemical Safety Report of disodium tetraborate, anhydrous

## PNEC values

**PNEC** add, freshwater, marine water = 1.35 mg B/L

**PNEC** add aqua intermittent = 9.1 mg B/L

**PNEC** add freshwater sediment, marine water sediment = 1.8 mg B/kg sediment dry weight

**PNEC** soil = 5.4 mg B/kg soil dry weight

**PNEC** add, STP = 1.75 mg B/L

Source: Chemical Safety Report of disodium tetraborate, anhydrous

## 8.2. Exposure controls

### 8.2.1. Appropriate engineering controls

No data available

### 8.2.2. Individual protection measures, such as personal protective equipment

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.

- *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.

### 8.2.3. Environmental exposure controls

No special requirement.

## SECTION 9. Physical and chemical properties

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

Appearance	crystalline solid, white
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/freezing point	741°C
Initial boiling point and boiling range	1575°C
Flash point	Non flammable
Evaporation rate	N.A.
Flammability (solid, gas)	N.A.
Upper/lower flammability or explosive limits	N.A.
Vapour pressure	Negligible @ 20°C
Vapour density	N.A.
Relative density	1.71 @ 20°C
Solubility in water	4.7% @ 20°C; 65.6% @ 100°C
Partition coefficient: n-octanol/water	Log Kow (Pow): 1.53±0.05 (at 22±1°C) pH 7.5
Auto-ignition temperature	N.A.
Decomposition temperature	8H <sub>2</sub> O @ 60°C & -10H <sub>2</sub> O @ 320°C
Viscosity	N.A.
Explosive properties	Non explosive
Oxidising properties	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

Low acute oral toxicity; LD<sub>50</sub> in rats is 6,000 mg/kg of body weight.

##### Skin corrosion/irritation

Low acute dermal toxicity; LD<sub>50</sub> in rabbits is greater than 2,000 mg/kg of body weight. Borax decahydrate is poorly absorbed through intact skin. Non-irritant.

##### Serious eye damage/ irritation

Borax decahydrate is a serious eye irritant.

**Respiratory or skin sensitisation** : N.A.

**Germ cell mutagenicity** : N.A.

**Carcinogenicity** :N.A.

##### 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.

**STOT-single exposure** : N.A.

**STOT-repeated exposure**: N.A.

##### Aspiration hazard

Low acute inhalation toxicity; LC<sub>50</sub> in rats is greater than 2.0 mg/l (or g/m<sup>3</sup>).

## SECTION 12. Ecological information

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 present is undissociated boric acid.

### 12.1. Toxicity

#### 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>[6]</sup>

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

72-hr EC<sub>50</sub> –biomass = 40 mg B/L, or 229 mg boric acid/L.

#### Invertebrate toxicity<sup>[7]</sup>

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

48-hr LC<sub>50</sub> = 133 mg B/L or 760 mg boric acid/L  
or 619 mg disodium tetraborate , anhydrous/L



## Fish toxicity<sup>[8]</sup>

Fish, Fatheted minnow, *Pimephales promelas* (Soucek et al., 2010)  
96-hr LC<sub>50</sub> = 79.7 mg B/L or 456 mg boric acid/L  
or 370 mg disodium tetraborate, anhydrous

## 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.

## 12.5. Results of PBT and vPvB assessment

N.A.

## 12.6. Other adverse effects

No Data Available.

## SECTION 13. Disposal considerations

### 13.1. Waste treatment 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 / legislation specific for the substance

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.

## EU Reach Regulation

Disodium Tetraborates are listed in the Candidate List of Substances of Very High Concern “SVHC” for eventual inclusion in Annex XIV to REACH Regulation 1907/2006 (“Authorisation List”). (18.06.2010-ED/30/2010).

Disodium tetraborates are listed in the Annex XVII of REACH Regulation 1907/2006 (EU No.109/2012) and their use in consumer products above specific concentration limits are restricted. Note that this restriction is only specific to consumer products and do not cover their industrial and/or professional applications. Disodium tetraborates can be used in consumer products below specific concentration limits (which is  $C \geq 8.5\%$  for Borax decahydrate).

## 15.2. Chemical safety assessment

Chemical Safety Assessment of Borax Decahydrate (disodium tetraborate decahydrate) has been carried out under REACH Regulation of the EU.

## SECTION 16. Other information

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

- This SDS complies with ISO 11014; the requirements of REACH Title IV and was updated to be in compliance with Annex II of REACH duly amended by **Commission Regulation (EU) No 453/2010 of 20 May 2010**.

Revision No	Revision content
06	<ul style="list-style-type: none"><li>• This SDS is updated in accordance with the ECHA Guidance on the Compilation of Safety data Sheets, Ver. 2.1 dated February 2014.</li><li>• It is revised in line with Eti Maden Corporate Identity.</li></ul>

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

<b>Eti Maden</b>	: Eti Maden İşletmeleri Genel Müdürlüğü
<b>SDS</b>	: Safety Data Sheet
<b>Index N°</b>	: atomic number of the element most characteristic of the properties of the substance
<b>CAS N°</b>	: Chemical Abstracts Service number
<b>EC N°</b>	: EINECS Number : European Inventory of Existing Commercial Substances
<b>REACH</b>	: Registration, Evaluation, Authorisation and Restrictions of Chemicals Regulation (EC) N°1907/2006
<b>Repr. Cat. 1B</b>	: substance presumed human reproductive toxicant
<b>Eye irrit. Cat. 2</b>	: substance inducing potential reversible eye irritation
<b>CLP</b>	: Classification Labelling Packaging Regulation: Regulation (EC) N°1272/2008
<b>1<sup>st</sup> ATP</b>	: 1st Adaptation to Technical and scientific Progress
<b>LD<sub>50</sub></b>	: Median Lethal Dose
<b>LC<sub>50</sub></b>	: Lethal Concentration, 50%
<b>N.A.</b>	: Not Applicable

Disclaimer: As the users' condition of work is not known, the information contained in this Material Safety Data Sheet is accurate to the best of our knowledge and is based on the national community regulations. The product must not be employed for uses other than those specified without having previously obtained written handling instructions. Users are responsible for taking all necessary to comply with the requirements of the law and local regulations. The information contained in this sheet should be regarded as the description of the safety requirements relating to our products and not as a guarantee of its properties.

<b>DNEL</b>	: Derived No effect Level
<b>PNEC</b>	: Predicted No Effect Concentration
<b>CSR</b>	: Chemical Safety Report
<b>OSHA</b>	: Occupational Safety & Health Administration
<b>Cal OSHA</b>	: The State of California Division of Occupational Safety and Health (DOSH)
<b>PEL</b>	: Permissible Exposure Limits
<b>ACGIH</b>	: American Conference of Governmental Industrial Hygienists
<b>TLV</b>	: Threshold Limit Value
<b>Japanese MITI</b>	: Japanese Ministry of International Trade and Industry
<b>EC<sub>50</sub></b>	: Half maximal effective concentration
<b>PBT</b>	: Persistent, Bioaccumulative and Toxic substance
<b>vPvB</b>	: Very Persistent and Very Bioaccumulative
<b>UN</b>	: United Nations
<b>U.S. EPA TSCA Inventory:</b>	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
<b>Canadian DSL</b>	: Canadian Domestic Substances List

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

According to CLP Regulation
Hazard Statement
<b>H360FD:</b> May damage fertility or the unborn child <b>H319:</b> Causes serious eye irritation
Precautionary Statements
<u><b>Prevention</b></u> <b>P201:</b> Obtain special instructions before use. <b>P202:</b> Do not handle until all safety precautions have been read and understood. <b>P264:</b> Wash eyes thoroughly after handling. <b>P280:</b> Wear protective gloves/ protective clothing/ eye protection/ face protection.
<u><b>Response</b></u> <b>P308 + P313:</b> If exposed or concerned: get medical advice/attention. <b>P305+P351+P338:</b> IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. <b>P337+P313:</b> If eye irritation persists: Get medical advice/attention.
<u><b>Storage</b></u> <b>P405:</b> Store locked up.
<u><b>Disposal:</b></u> <b>P501:</b> Dispose of contents/container to in accordance with local regulations.

### 16.4. Key literature references and sources for data:

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. Weir R J, Fisher R S, Toxicol. Appl. Pharmacol., (1972), 23, 351-364
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

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5. Heindel *et al.*, Fund. Appl. Toxicol. (1992) 18, 266-277
6. Hansveit and Oldersma, 2000; TNO Nutrition and Food Research Institute. Report No. V99.157.
7. Gersich, FM (1984a). Environ.Toxicol.Chem., 3 #1, 89-94 (1984)
8. Soucek *et al.*, 2010. Illinois Natural History Survey, University of Illinois.
9. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085
10. Scialli AR, Bonde JP, Brüske-Hohlfeld I, Culver D, Li Y, Sullivan FM; ELSEVIER 2009
11. Robbins WA, Xun L, Jia J, Kennedy N, Elashoff DA, Ping L. ;ELSEVIER 2009;(Reproductive Toxicology)

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'.