

**ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ (Turkish name)**  
**ETİ MINE WORKS GENERAL MANAGEMENT (English name)**  
**TECHNOLOGY DEVELOPMENT**  
**DEPARTMENT**

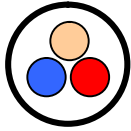
# **BORAX DECAHYDRATE**

## **HEALTH AND SAFETY DATA SHEET**

Date of Issue : March 2007  
Revision No : 3  
Date of Revision : July 2008

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July 2008  
(Safety Data Sheet in compliance with REACH Title IV / Annex II and ISO 11014)



ETİ MADEN İŞLETMELERİ  
GENEL MÜDÜRLÜĞÜ

## 1. Identification of the Substance / Preparation and the Company / Undertaking

### 1.1. Identification of the substance or preparation

Borax Decahydrate

**Registration number :**

**Pre-registration number under REACH Regulation:** 05-2114097666-32-0000

**To be registered till 30/11/2010.**

**Trade names:** Borax Decahydrate

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

### 1.2. Use of the substance / preparation

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

- Ceramics
- Detergent
- Borosilicate glass
- Insulation fiberglass

### 1.3. Company/undertaking identification:

**Exporter:**

**Name :** ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ (Turkish name)  
ETİ MINE WORKS GENERAL MANAGEMENT (English name)

**Address :** Sıhhiye, Cihan Sok. No:2, 06430, Ankara, Türkiye.

**Phone No:** 00 90 312 294 23 42

**Fax No :** 00 90 312 232 59 10

**Manufacturer:**

**Name :** ETİ MADEN İŞLETMELERİ GENEL MÜDÜRLÜĞÜ (Turkish name)  
ETİ MINE WORKS GENERAL MANAGEMENT (English name)

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**Phone No:** 00 90 312 294 23 42

**Fax No :** 00 90 312 232 59 10

**1.4. Emergency phone number :** 00 90 312 294 23 45 (Available office hours)

: 00 90 312 232 59 10 (Available office hours)

## 2. Hazards Identification

### Emergency overview

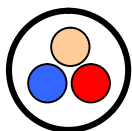
Borax decahydrate is a white odourless, powdered substance that is not flammable, combustible, or explosive, and has low acute oral and dermal toxicity.

### 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 greater than 10 mg/m<sup>3</sup>.



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### **Eye contact**

Borax decahydrate is a mild 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.

### **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.

### **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).

## **3. Composition / Information on Ingredients**

### **3.1. Chemical composition:**

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

#### **Components**

CAS- N°	EINECS	Name	EC Classification
1303-96-4	215-540-4	Borax decahydrate	no classification

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

## **4. First aid measures**

### **Skin contact**

No treatment necessary because non-irritating.

### **Eye contact**

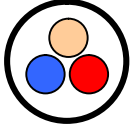
Use eye wash fountain or fresh water to cleanse eye. If irritation persists for more than 30 minutes, seek medical attention.

### **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), give two glasses of water or milk to drink and seek medical attention.



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#### **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).

## **5. Fire-fighting measures**

#### **General hazard**

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

#### **Extinguishing media**

Any fire extinguishing media may be used on nearby fires.

## **6. Accidental release measures**

#### **Personal precautions**

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

#### **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).

#### **Methods for 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).

## **7. Handling and Storage**

#### **7.1. Safe Handling Advice**

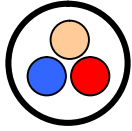
To maintain package integrity and to minimise caking of the product, bags should be handled on a first-in first-out basis. Good housekeeping and dust prevention procedures should be followed to minimise dust generation and accumulation. Your supplier can advise you on safe handling, please contact the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

#### **7.2. Storage**

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 Use(s)**

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



## 8. Exposure controls / Personal protection

### 8.1. Exposure limit values

Respect regulatory provisions for dust (total and respirable).

- *Occupational exposure limits : Borax decahydrate is regulated by OSHA, Cal OSHA and ACGI.*

ACGIH/TLV	5 mg/m <sup>3</sup>
Cal OSHA/PEL	5 mg/m <sup>3</sup>
OSHA/PEL (total dust)	10 mg/m <sup>3</sup>

#### 8.2.1. OCCUPATIONAL EXPOSURE CONTROLS

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.

#### 8.2.2. ENVIRONMENTAL EXPOSURE CONTROLS

No special requirement.

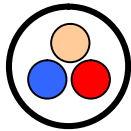
## 9. Physical and chemical properties

### 9.1. General information

Physical state	crystalline solid
Colour	white
Odour	odourless
Molecular weight	381.37
Bulk Density	810 kg/m <sup>3</sup>
Specific gravity	1.71 – 1.73

### 9.2. Important health, safety and environmental information

Melting temperature	62°C (heated in closed space)
Boiling point	1575 °C
Flash point	Non flammable
Explosion hazard	Non explosive
Solubility in water	4.7% @ 20°C; 65.6% @ 100°C
Vapour pressure	Negligible @ 20°C
pH @ 20°C	9.3 (0.1 % solution)
	9.2 (1.0% solution)
	9.3 (4.7 % solution)



## 10. Stability and Reactivity

### General

Borax decahydrate is a stable product, but when heated it loses water, eventually forming anhydrous borax ( $\text{Na}_2\text{B}_4\text{O}_7$ ).

### Hazardous decomposition or polymerisation

None

### Incompatible materials and conditions to avoid:

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

## 11. Toxicological information

### 11.1. Acute effects

#### Ingestion<sup>[2]</sup>

Low acute oral toxicity;  $\text{LD}_{50}$  in rats is 6,000 mg/kg of body weight.

#### Skin

Low acute dermal toxicity;  $\text{LD}_{50}$  in rabbits is greater than 2,000 mg/kg of body weight. Borax decahydrate is poorly absorbed through intact skin.

#### Inhalation

Low acute inhalation toxicity;  $\text{LC}_{50}$  in rats is greater than 2.0 mg/l (or  $\text{g/m}^3$ ).

#### Skin irritation

Non-irritant.

#### Eye irritation

Mild eye irritant in rabbits. Fifty years of occupational exposure to borax decahydrate indicate no adverse effects on human eye. Borax decahydrate is a constituent of eye lotions.

#### Sensitisation

Borax decahydrate is not a skin sensitiser.

### 11.2. Chronic effects

#### Reproductive/Developmental 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>.

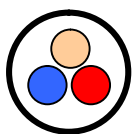
#### Carcinogenicity/Mutagenicity

Not a carcinogen.

Not a mutagen.

#### Human data

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.



## 12. Ecological information

Not persistent, not bioaccumulative.

### ECOTOXICITY DATA

#### General

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>[6]</sup>

Green algae, *Scenedesmus subspicatus*

96-hr IC<sub>10</sub> = 24 mg B/l †

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

Daphnia, *Daphnia magna* Straus

24-hr IC<sub>50</sub> = 242 mg B/l †

#### Fish toxicity

Sea water<sup>[8]</sup>:

Dab, *Limanda limanda* 96-hr LC<sub>50</sub> = 74 mg B/l †

Fresh water<sup>[9]</sup>:

Rainbow trout, *Oncorhynchus mykiss* (embryo-larval stage)

24-day LC<sub>50</sub> = 88 mg B/l †

32-day LC<sub>50</sub> = 54 mg B/l †

Goldfish, *Carassius auratus* (embryo-larval stage)

7-day LC<sub>50</sub> = 65 mg B/l †

3-day LC<sub>50</sub> = 71 mg B/l †

Test substance: † Sodium tetraborate

### ENVIRONMENTAL FATE DATA

#### Persistence/Degradation

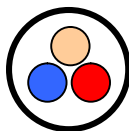
Boron is naturally occurring and ubiquitous in the environment. Borax decahydrate decomposes in the environment to natural borate.

#### Octanol/Water partition coefficient

No value. In aqueous solution borax decahydrate is converted substantially into undissociated boric acid.

#### Soil mobility

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



## 13. Disposal considerations

### Disposal guidance

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.

## 14. Transport information

### International transportation

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

## 15. Regulatory information

### General

Ensure all national/local regulations are observed.

### 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    |

## 16. Other information

### References

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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. Guhl W, SÖFW-Journal (1992) 181 (18/92), 1159-1168
7. Schöberl P, Marl and Huber L (1988) Tenside Surfactants Detergents 25, 99-107
8. Hugman S J and Mance G (1983) Water Research Centre Report 616-M
9. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085

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'.