



Report Date: 01/01/2017

Revision Date: 01/01/2017

Revision no. 01 Submit date: 01/02/2017

1.1. Product identifier

Chemical name : Disodium tetraborate decahydrate

EC No : 215-540-4

CAS No. : 1303-96-4

Index No.: 005-011-01-1

REACH registration No. : 01-2119490790-32-0002

Trade names: Borax Decahydrate

Synonyms: Borax, Sodium Borate Decahydrate, Disodium Tetraborate decahydrate.

1.2. Relevant identified uses of the substance or mixture and uses advised against

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

Ceramics

Detergent

Borosilicate glass

Insulation fiberglass

1.2.2. Uses advised against

None

1.3. Details of the supplier of the safety data sheet

HD Chemicals LTD

9 Scott Business Park

PL2 2PB Plymouth UK

2.1. Classification of the substance or mixture

2.1.1. Classification according to Regulation (EC) No. 1272/2008 [CLP]

a. Harmonised classification provided in the 1st 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

2.1.2. Classification according to Directive 67/548/EEC

Repr. Cat. 2; R60-R61

Xi ; R36

Concentrations limits: C ≥8.5%: R;R60-61

Risk Phrases: R60 ; R61; R36

Safety Phrases: S45; S53; S26

Precautionary Statement Prevention :P201; P202; P281; 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. Labelling according to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictograms (CLP):



Signal word (CLP): DANGER

Hazard statements (CLP) :

H319:- Causes serious eye irritation

H360FD:- May damage fertility or the unborn child

Precautionary statements (CLP):

P201:- Obtain special instructions before use.

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

P280:- Wear Protective gloves, eye 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/m³.

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.

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 did not 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 No. CAS Number	Registration Number	Purity	Risk Phrases	Hazard Statement
Borax decahydrate	215-540-4 1303-96-4	01-2119490790-32-0002	99.9%	R36; R60; R61; Xi	H319 H360FD

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

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

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

Not applicable.

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

Not applicable.

SECTION 5: Firefighting measures.

5.1. Extinguishing media

Use extinguishing media appropriate for the surrounding materials.

5.2. Special hazards arising from the substance or mixture



Report Date: 01/01/2017

Revision Date: 01/01/2017

Revision no. 01 Submit date: 01/02/2017

This product is non-combustible, not flammable or explosive.

5.3. Advice for firefighters

Special Fire Fighting Procedures: Cool containers exposed to flames with water until well after the fire is out. Move container from fire area if it can be done without risk. Dyke and collect extinguishing water.

Protective equipment for fire-fighters: Use of approved supplied air or self-contained breathing apparatus operated in positive pressure mode must be worn in case of fire.

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 section 8 and 13 for more information.

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.

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 identified uses for this product are detailed in Section 1.2

See exposure scenario in Annex to the SDS.



8.1. Control parameters

Occupational Exposure Limit Values

Substance	Sodium Tetraborate decahydrate			
CAS No.	1303-96--4			
	Limit value – 8 hours		Limit value – Short term	
	ppm	mg/m ³	ppm	mg/m ³
Belgium		2		6
Canada – Quebec		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/m³

Cal OSHA/PEL 10 mg/m³

OSHA/PEL (total dust) 15 mg/m³

OSHA/PEL (respirable dust) 5 mg/m³

DNEL values

Exposure pattern	Type/site of effect	Exposure route	DNEL value
DNEL's for workers			
Acute	Local	Inhalation	22.3mg/m ³
Long-term	Systemic	Inhalation	12.8mg/m ³
Long-term	Systemic	Dermal	42478mg/day
DNEL's for the general public			



Acute	Systemic	Oral	1.5mg/kg bw/day
Acute	Local	Inhalation	22.3mg/m3
Long-term	Systemic	Dermal (external)	303.5mg/kg bw/day
Long-term	Systemic	Dermal (systemic)	1.5mg/kg bw/day
Long-term	Systemic	Inhalation	6.5mg/m3
Long-term	Systemic	Oral	1.5mg/kg bw/day
Long-term	Local	Inhalation	22.3mg/m3

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.

Use as far as possible in a closed system. Provide a regular control of the atmosphere. Emergency eye wash fountains and safety showers should be available in the immediate

vicinity of any potential exposure. Local exhaust and general ventilation must be adequate to meet exposure standards. Please refer to the annex (exposure scenarios).

Hand protection: Use gloves resistant to chemical products corresponding to EN 374:3. Take advice to gloves' supplier.

Eye protection: Wear safety glasses with side shields according EN 166.

Skin and body protection: Wear closed protective clothing.

Respiratory protection: Use respiratory protection mask according to EN 140 or EN 405 with filter type P3 according to EN 143:2000 or FFP3 according to EN 149:2001.

Physical state	Solubility in water
Colour	Solubility Value (g/100g H ₂ O@20°C)
Odour	Partition Coefficient (N-Octanol/Water)
Odour threshold	Viscosity, dynamic
pH @20°C	Explosive properties
	Oxidising properties
	Explosive limits

Relative evaporation rate (butylacetate=1)

Melting point /freezing point

Initial boiling point and boiling range

Flash point

Self-ignition temperature

Decomposition temperature

Flammability (solid, gas)

Vapour pressure

Vapour density

Relative Density



Report Date: 01/01/2017

Revision Date: 01/01/2017

Revision no. 01 Submit date: 01/02/2017

Crystalline solid powder.

white.

odourless.

Not applicable

9.3 (0.1% solution)

9.2 (1.0% solution)

9.3 (4.7% solution)

No data available

741 °C (heated in closed space)

1575⁰C

Not flammable

Not applicable

8H₂O@ 60°C & -10H₂O @ 320°C

Not flammable

Negligible @20⁰C

Not applicable

1.72@20⁰C

4.7%@20⁰C;65.6%@100⁰C

4.92

Log Kow (Pow): 1.53±0.05 (at 22±1°C) pH

7.5

No data available

No data available

Product is not explosive

No data available



9.2. Other information

Molecular Formula:	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
Molecular weight	381.37
Specific Gravity	1.71 – 1.73@20 ⁰ C

SECTION 10: Stability and reactivity.

10.1. Reactivity

Not applicable.

10.2. Chemical stability

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

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

Protect from water, moisture and strong heat

10.5. Incompatible materials

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

10.6. Hazardous decomposition products

Not applicable.

11.1. Information on toxicological effects

11.1.1. Substances

Acute Toxicity

Low acute oral toxicity; LD50 in rats is 6,000 mg/kg of body weight.

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.

Serious eye damage/ irritation

Borax decahydrate is a serious eye irritant.

Respiratory or skin sensitisation

Not applicable.

Germ cell mutagenicity



Not applicable.

Carcinogenicity

Not applicable.

Reproductive toxicity

Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes[2]. 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 [3,4,5]. 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

Not applicable.

STOT-repeated exposure

Not applicable.

Aspiration hazard

Low acute inhalation toxicity; LC50 in rats is greater than 2.0 mg/l (or g/m³).

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.

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[6]

Green algae, *Pseudokirchneriella subcapitata* (Hansveit and Oldersma, 2000)
72-hr EC50 –biomass = 40 mg B/L, or 229 mg boric acid/L.

Invertebrate toxicity[7]

Daphnia, Daphnids, *Daphnia magna* (Gersich, 1984a)
48-hr LC50 = 133 mg B/L or 760 mg boric acid/L
or 619 mg disodium tetraborate, anhydrous/L

Fish toxicity[8]

Fish, Fathead minnow, *Pimephales promelas* (Soucek et al., 2010)
96-hr LC50 = 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. Bio accumulative potential

Not significantly bio-accumulative.

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

Not applicable.

12.6. Other adverse effect

No data available.

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.

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not classified as dangerous according to Transport Regulations

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards



Environmentally Hazard substance/Marine Pollutant - No

14.6. Special precautions for user

14.6.1. Overland transport

Not applicable

14.6.2. Transport by sea

No additional information available

14.6.3. Air transport

No additional information available

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

Not applicable

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

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

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.

16.1. Unique change made to the previous version of this Material Safety Data Sheet (MSDS).

Update of the emergency number pursuant to Article 1.4 Annex II of REACH Regulation (see section 1.4)

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

MSDS : Material Safety Data Sheet

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

CAS N°: Chemical Abstracts Service number

EC N° : EINECS Number : European Inventory of Existing Commercial Substances

REACH : Registration, Evaluation, Authorisation and Restrictions of Chemicals Regulation (EC) N°1907/2006

DSD: Dangerous Substances Directive 67/548/EEC

Repr. Cat. 1B: substance presumed human reproductive toxicant

Eye irrit. Cat. 2: substance inducing potential reversible eye irritation

CLP: Classification Labelling Packaging Regulation: Regulation (EC) N°1272/2008

1st ATP : 1st Adaptation to Technical and scientific Progress

LD50: Median Lethal Dose

LC50: Lethal Concentration, 50%

N.A. Not Applicable

DNEL: Derived No effect Level

PNEC: Predicted No Effect Concentration

CSR: Chemical Safety Report

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

EC50: Half maximal effective concentration

PBT: Persistent, Bioaccumulative and Toxic substance

vPvB: Very Persistent and Very Bioaccumulative



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 R phrases, hazard statements, safety phrase and/or precautionary statements used in this MSDS.

According to DSD Directive	According to CLP Regulation
Risk Phrases	Hazard Statements
<p>R60 : May impair fertility R61 : May cause harm to the unborn child R36 : Irritating to eyes</p>	<p>H360 FD: May damage fertility or the unborn child H319: Causes serious eye irritation</p>
<p>S45: In case of accident or if you fell unwell, contact a doctor or poisons information centre immediately (show the label where possible). S53: Avoid exposure – obtain special instructions before use. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</p>	<p>Prevention 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. 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/containers in accordance with local regulations.</p>



16.4. References.

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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
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)
- 12.
13. 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'.
- 14.

16.5. Disclaimer of Liability.

- 15.
- 16.
17. *This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*
- 18.
19. **DISCLAIMER OF LIABILITY** *The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable*