

Material Safety Data Sheet Anhydrous Borax

1. IDENTIFICATION OF THE SUBSTANCE

Chemical name/synonyms: Anhydrous borax, dehydrated borax, disodium tetraborate.

Use of the substance: The product is used in industrial manufacturing, in particular in metallurgical fluxes, glass, fibreglass, ceramics, fertilizers, flame retardants.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Nature of the Substance / Preparation: The product contains greater than 99 percent (%) anhydrous borax $\text{Na}_2\text{B}_4\text{O}_7$

Components :

CAS- N° 1330-43-4

EINECS 215-540-4

EC Classification no classification

(for other "Chemical inventory listing", please refer to section 15)

3. HAZARDS IDENTIFICATION

Emergency overview: Anhydrous borax is a white, odourless, granular 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 anhydrous borax is poorly absorbed through intact skin.

Inhalation: Occasional mild irritation effects to nose and throat may occur from inhalation of anhydrous borax dusts at levels greater than 10 mg/m^3 .

Eye contact: Anhydrous borax is a mild eye irritant.

Skin contact: Anhydrous borax does not cause irritation to intact skin.

Ingestion: Products containing anhydrous borax are not intended for ingestion. Anhydrous borax 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 anhydrous borax can be harmful to plants and other species. Therefore releases to the environment should be minimized.

Signs and symptoms of exposure: Symptoms of accidental over-exposure to anhydrous borax have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting, and diarrhea, with delayed effects of skin redness and peeling (see section 11).

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.

Note to physicians: Observation only is required for adult ingestion of less than 5 grams of anhydrous borax. For ingestion in excess of 5 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).

5. FIRE-FIGHTING MEASURES

General hazard: None, because anhydrous borax 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 high level of airborne dust, wear a personal respirator in compliance with national legislation.

Environmental precautions: Anhydrous borax is a water-soluble white powder that may cause damage to trees or vegetation by root absorption (see section 12).

Methods for cleaning up (Land spill): Vacuum, shovel or sweep up anhydrous borax 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

Safe Handling Advice and storage: No special handling precautions are required, but dry, indoor storage is recommended. To maintain package integrity and to minimize caking of the product, bags should be handled on a first-in first-out basis. Good housekeeping procedures should be followed to minimize dust generation and accumulation. The product should be kept away from strong reducing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit values: Respect regulatory provisions for dust (inhalable and respirable).

A. OCCUPATIONAL EXPOSURE CONTROLS

Use local exhaust ventilation to keep airborne concentrations of anhydrous borax dust below permissible exposure levels.

Respiratory protection: Where airborne concentrations are expected to exceed exposure limits, respirators should be used.

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

B. ENVIRONMENTAL EXPOSURE CONTROLS

No special requirement.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	granular solid
Colour	white
Odour	odourless
Molecular weight	201.22
Specific gravity	2.37
Melting temperature	741°C
Boiling point	1575 °C

Flash point	Non flammable
Explosion hazard	Non explosive
Solubility in water	2.48% @ 20°C
Vapour pressure	Negligible @ 20°C
pH @ 20°C	9.2 (1 % solution)

10. STABILITY AND REACTIVITY

Anhydrous borax is a stable product.

Hazardous decomposition or polymerization: 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

ACUTE TOXICITY

Ingestion^[2]: Low acute oral toxicity; LD₅₀ in rats is 2,400 to 2,600 mg/kg of body weight.

Skin: Low acute dermal toxicity; LD₅₀ in rabbits is greater than 2,000 mg/kg of body weight. Anhydrous borax is poorly absorbed through intact skin.

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

Skin irritation: Non-irritant.

Eye irritation: Mild eye irritant in rabbits. Fifty years of occupational exposure to anhydrous borax indicate no adverse effects on human eye. Anhydrous borax is non-irritating to eyes in normal industrial use.

Sensitization: Anhydrous borax is not a skin sensitizer.

Reproductive/Developmental 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 fetus including fetal 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].

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 boric acid dust and 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

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 minimize the amount of borate product released to the environment.

ENVIRONMENTAL FATE DATA

Persistence/Degradation: Boron is naturally occurring and ubiquitous in the environment.

Octanol/Water partition coefficient: No value. In aqueous solution anhydrous borax 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 anhydrous borax 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: Anhydrous borax has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

15. REGULATORY INFORMATION

Ensure all national/local regulations are observed.

Clean Air Act (Montreal Protocol): Anhydrous borax 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	1330-43-4
Canadian DSL	1330-43-4
EINECS	215-540-4
South Korea	1-760
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
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 7. Schöberl P, Marl and Huber L (1988) *Tenside Surfactants Detergents* 25, 99-107
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 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'.



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