DUDA ENERGY, LLC.

Safety Data Sheet
Boric Acid

SECTION 1: Identification

1.1 Product identifier

Product name	Boric Acid
Substance name	Boric acid
EC no.	233-139-2
CAS no.	10043-35-3
Index no.	005-007-00-2
REACH registration	01-2119486683-25-0006

1.2 Other means of identification

Orthoboric acid, boraric acid

1.3 Recommended use of the chemical and restrictions on use

Weatherproofing wood, fireproofing fabrics, as a preservative, manufacture of cements, crockery, porcelain enamels, borosilicate (heat resistant) glass, borates, leather, carpets, hats, soaps and artificial gems; in nickeling baths, cosmetics, printing and dyeing, painting, photography, for impregnating wicks, electric condensers, hardening steel, insecticide for cockroaches and black carpet beetles, astringent, antiseptic, glass fibers, metallurgy (welding flux, brazing copper), flame retardant in cellulosic insulation, mattress batting and cotton textile products; fungus control on citrus fruits, to allow talcum powder to flow more freely and as an ingredient of ear drops for the treatment of swimmer's ear, ointment to help heal skin irritations, eye drops to soothe irritated eyes, hemorrhoid ointment and skin cleansers. Aqueous solutions have been used as mouth-washes, eye lotions, skin lotions, douches for irrigating the bladder and vagina and as hot fomentations for ulcers, whitlows, boils and carbuncles. Its value for these purposes is doubtful; there are more effective and safer antibacterial and antifungal agents.

1.4 Supplier's details

Name	Duda Energy, LLC.
Address	1112 Brooks St. Decatur, AL 35601 USA
Telephone	256.340.4866

1.5 Emergency phone number(s)

800.255.3924 Chemtel

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 6

- Toxic to reproduction, Cat. 2

2.2 GHS label elements, including precautionary statements

Pictogram

Signal word	**Danger**

Hazard statement(s)

H360	May damage fertility or the unborn child [effect, route]

Precautionary statement(s)

P201	Obtain special instructions 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.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P405	Store locked up.
P501	Dispose of contents/container to …

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name	Boric acid
EC no.	233-139-2
CAS no.	10043-35-3
Index no.	005-007-00-2
Formula	H3BO3
Molecular weight	61.83
Other names / synonyms	acid borique ; Boric acid; Boric acid (H3BO3); NCI-C56417; THREE ELEPHANT; ORTHOBORIC ACID; HYDROGEN ORTHOBORATE; BOROFAX; BORACIC ACID; BORICACID
Impurities and stabilizing additives	None

N/A

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

General advice	Never give anything by mouth to an unconscious person. IF exposed or concerned: Get medical advice/attention.
If inhaled	Allow victim to breathe fresh air. Allow the victim to rest.
In case of skin contact	Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
In case of eye contact	Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.
If swallowed	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

Personal protective equipment for first-aid responders

Respiratory protection may be required if clouding of dust is present.

4.2 Most important symptoms/effects, acute and delayed

Symptoms/injuries: May damage fertility or the unborn child.
Symptoms/injuries after inhalation: May cause respiratory irritation.
Symptoms/injuries after skin contact: Slight irritation.
Symptoms/injuries after eye contact: May cause slight irritation.
Symptoms/injuries after ingestion: Nausea. Vomiting. Diarrhea. May cause cyanosis.
Chronic symptoms: Cracking of the skin.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Foam. Dry powder. Carbon dioxide. Water spray. Sand.

DO NOT use a heavy water stream.

5.2 Specific hazards arising from the chemical

None

5.3 Special protective actions for fire-fighters

Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
Do not enter fire area without proper protective equipment, including respiratory protection.

Further information

None

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

Boric acid is a water-soluble white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption.

6.3 Methods and materials for containment and cleaning up

Land spill: Vacuum, shovel, or sweep up boric acid 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.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

To maintain package integrity and to minimize 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 minimize dust generation and accumulation. 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.

Specific end use(s)

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

1. Boric acid (CAS: 10043-35-3 EC: 233-139-2)

STEL: 6 mg/m3; USA (ACGIH)
Upper Respiratory Tract irritation. Not classifiable as a human carcinogen varies

TWA: 2 mg/m3; USA (ACGIH)
Upper Respiratory Tract irritation. Not classifiable as a human carcinogen varies

STEL: 6.000000
mg/m3; USA (ACGIH)
Upper Respiratory Tract irritation. Not classifiable as a human carcinogen varies

STEL: 6.000000
mg/m3; USA (ACGIH)
Upper Respiratory Tract irritation. Not classifiable as a human carcinogen varies

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TWA: 2.000000
mg/m3; USA (ACGIH)
Upper Respiratory Tract irritation. Not classifiable as a human carcinogen varies

8.2 Appropriate engineering controls

Maintain air concentrations below occupational exposure standards.
Use local exhaust ventilation to keep airborne concentrations of boric acid dust below permissible exposure levels. Wash hands before breaks and at the end of the work day. Remove and wash soiled clothing.

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

Eye/face protection

No special protection is required. Goggles and gloves may be warranted if environment is excessively dusty.

Body protection

See: 8.1 (Eye/face protection)

Respiratory protection

In case of prolonged exposure to dust wear a personal respirator in compliance with national legislation. Where airborne concentrations are expected to exceed exposure limits, respirators should be used.

Environmental exposure controls

No special requirement.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance/form (physical state, color, etc.)	Crystalline, White Solid
Odor	No data available.
Odor threshold	No data available.
pH	5.1 at 1.8 g/l at 25 °C (77 °F)
Melting point/freezing point	160 °C (320 °F) - dec.
Initial boiling point and boiling range	1860°C
Flash point	No data available.
Evaporation rate	No data available.
Flammability (solid, gas)	No data available.
Upper/lower flammability limits	
Vapor pressure	No data available.
Vapor density	No data available.
Relative density	1.440 g/cm3
Solubility(ies)	In Water: 4.7% @ 20°C; 27.5% @ 100°C
Partition coefficient: n-octanol/water	No data available.
Auto-ignition temperature	No data available.

Decomposition temperature	169±1 to HBO2 & -1 1/2 H20 at 300°C
Viscosity	No data available.
Explosive properties	Non-explosive
Oxidizing properties	No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity

N/A

10.2 Chemical stability

Boric acid is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. When heated, it loses water - first, forming metaboric acid (HBO2) and, on further heating, it is converted into boric oxide (B2O3).

10.3 Possibility of hazardous reactions

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

10.4 Conditions to avoid

N/A

10.5 Incompatible materials

Boric acid reacts as a weak acid which may cause corrosion of base metals. Avoid contact with strong reducing agents such as metal hydrides or alkali.

10.6 Hazardous decomposition products

N/A

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

Low acute oral toxicity; LD50 in rats is 3,500 to 4,100 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. Boric acid is poorly absorbed through intact skin. Non-irritant.

Serious eye damage/irritation

Non-irritant.

Respiratory or skin sensitization

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. Studies 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. 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.

Summary of evaluation of the CMR properties
N/A

STOT-single exposure
N/A

STOT-repeated exposure
N/A

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

Additional information
None

SECTION 12: Ecological information

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 minimize the amount of borate product released to the environment.

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

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

Fish toxicity:
Fish, Fathered minnow, Primephales promelas (Soucek et al., 2010)
96hr LC50 = 79.7mg B/L or 456mg boric acid/L or 370mg disodium tetraborate, anhydrous/L

Persistence and degradability
Boron is naturally occurring and ubiquitous in the environment. Boric acid decomposes into the environment to natural borate.

Bioaccumulative potential
Not significantly bio-accumulative.

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

Results of PBT and vPvB assessment

N/A

Other adverse effects
No Data Available.

SECTION 13: Disposal considerations

Disposal of the product
Small quantities of boric acid 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 uswed for an appropriate application.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Pennsylvania Right To Know Components
Boric acid
CAS-No. 10043-35-3

New Jersey Right To Know Components
Boric acid
CAS-No. 10043-35-3

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

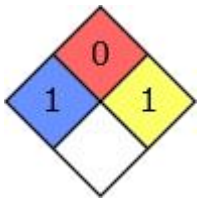
SARA 311/312 Hazards
Chronic Health Hazard

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

NFPA Rating



SECTION 16: Other information

16.1 Further information/disclaimer

The information provided in this Safety Data Sheet is correct to the best of Duda Energy LLC's knowledge, information, and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. This Safety Data Sheet only contains information relating to safety and does not replace any product information or product specification. Please note, the content may be changed, corrected, or deleted at any time without notice and may not always necessarily reflect the most current data. Duda Energy LLC will assume no responsibility for any trouble or failure caused by the errors in the information provided, nor any damage associated with the usage of the information.

16.2 Preparation information

Version: 2
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