1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	**Boron-10 (^{10}B) Boric Acid**
Chemical Formula	H_3BO_3
Molecular Weight	61.83 g/mol
CAS No.	113813-79-1
Recommended Use	Commercial Nuclear Reactor Chemistry
Supplier Address*	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
Telephone	+1 415-440-4433
Fax	+1 415-563-4433
Emergency Phone Number (both supplier and manufacturer)	Infotrac / +1 800-535-5053 *May include subsidiaries or affiliate companies/divisions
Email	iusa@isoflex.com
Website	www.isoflex.com
Preparation Information	ISOFLEX USA Product Safety +1 415-440-4433

2. HAZARDS IDENTIFICATION

Emergency Overview

This material is odorless, white, solid crystals.

Health Hazards	May produce irritation of the nasal mucous membranes, the respiratory tract, and eyes. Ingestion of this material may cause harm. Prolonged or chronic exposure may cause adverse effects on the central nervous system and/or gastrointestinal system, as well as liver and/or renal damage.
Flammability Hazards	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire
Emergency Recommendations:	Emergency responders must wear personal protective equipment appropriate for the situation to which they are responding and to the chemical hazards of this material. Caution should be used when responding to releases.

NFPA Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 1 **Flammability = 0** **Reactivity = 0**

HMIS Ratings: (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health Hazard = 1 **Flammability = 0** **Physical Hazard = 0**

HEALTH HAZARD	1
FLAMMABILITY	0
PHYSICAL HAZARD	0

Label Elements

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

Hazard Pictograms (CLP):

Symbols:	Health Hazard I
Signal Word:	Danger
Reproductive Toxicity:	Category IB
Hazard Statements:	H360 – May damage fertility or the unborn child.
Precautionary Statements:	P201 - Obtain special instructions before use
	P202 - Do not handle until all safety precautions have been understood
	P280 - Wear protective gloves

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Product Name	Boron-10 (^{10}B) Boric Acid
Chemical Formula	H_3BO_3
Molecular Weight	61.83 g/mol
CAS No.	113813-79-1

4. FIRST AID MEASURES

General	Move victim(s) out of dangerous area. Consult a physician and/or the nearest Poison Control Center for all exposures except minor instances of skin contact. Take copy of this SDS to physician or other health professional.
Inhalation	Remove victim(s) to fresh air as quickly as possible. If not breathing, give artificial respiration. Seek immediate medical attention.
Skin	May be harmful if absorbed through skin. May cause skin irritation. If material contaminates the skin, wash with soap and water.
Eye Contact	May cause eye irritation. If material enters the eyes, open eyes under gently running water. Use sufficient force to open eyelids. Have contaminated individual "roll" eyes. Minimum flushing is for 15 minutes. Do not interrupt flushing. Seek immediate medical attention if any adverse effect occurs.
Ingestion	Harmful if swallowed. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water, Seek medical attention.

5. FIREFIGHTING MEASURES

Fire Extinguishing Materials:	Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
Special Hazards:	None inherent in this product
Special Equipment:	No special protective actions for fire-fighters are anticipated

6. ACCIDENTAL RELEASE MEASURES

Emergency Release Response

Evacuate area. Ventilate the area with fresh air. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

Environmental Precautions

Avoid release to the environment

Methods and Material for Containment and Cleanup

Collect as much of the spilled material as possible. Use wet sweeping compound or water to avoid dusting. Sweep up. Place in a closed container approved for transportation by appropriate authorities. Clean up residue. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

7. HANDLING AND STORAGE

Work and Hygiene Practices	Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Use personal protective equipment (gloves, respirators, etc.) as required
Conditions for Safe Storage	Store at room temperature, Keep container tightly sealed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Boric acid (H_3BO_3)	13813-79-1	ACGIH	TWA(inhalable fraction):2 mg/m3;STEL(inhalable fraction):6 mg/m3	A4: Not class. as human carcm

ACGIH: American Conference of Governmental Industrial Hygienists

Personal Protective Equipment Gloves, safety glasses, protective clothing, respiratory protection

Skin Protection

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.
Gloves made from the following material(s) are recommended: Nitrile Rubber

Eye Protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended: Safety Glasses with side shields.

Respiratory Protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure: Half facepiece or full facepiece air-purifying respirator suitable for particulates

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9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	*Solid*
Color	*White*
Specific Physical Form	*Crystals*
Odor	*Odorless*
Odor threshold	*No Data Available*
pH	4 *[Details:!%* Aqueous Solution]
Melting point	170 - 180 °C
Boiling Point	No flash point
Flash Point	*Not Applicable*
Evaporation rate	Not Classified
Flammability (solid, gas)	*Not Applicable*
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	15 mmHg [@21 °C]
Vapor Pressure	*Not Applicable*
Vapor Density	1.4 - 1.5 g/cm3 [@ 20 °C]
Density	1.4-1.5 [@20°C] *[RefStd:WATER=I]*
Specific Gravity	4.9 % [@ 20 °C]
Solubility In Water	*No Data Available*
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*Not Applicable*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Viscosity	*Not Applicable*

Molecular weight	*No Data Available*
Percent volatile	*Not Applicable*

10. STABILITY AND REACTIVITY

Reactivity	This material may be reactive with certain agents under certain conditions - see the remaining headings in this section
Chemical Stability	Stable
Hazardous Decomposition Products	Under fire conditions: Hydrogen Gas, Irritant Vapors or Gases
Materials with Which Substance Is Incompatible	Alkali and alkaline earth metals
Possibility of hazardous reactions	Hazardous polymerization will not occur.
Conditions to Avoid	Heat, Sparks and/or flames

11. TOXICOLOGICAL INFORMATION

Ingestion	Harmful if swallowed, Gastrointestinal Irritation: Signs/symptoms may Include abdominal pain, stomach upset, nausea, vomiting and diarrhea.
Inhalation	Respiratory tract irritation: signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.
Skin	Contact with the skin during product use is not expected to result in significant irritation.
Eyes	Mechanical eye irritation: Signs/symptoms may include pain, redness, tearing and corneal abrasion
Ingestion	May be harmful if swallowed. Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Additional Health Effects

Reproductive toxicity	Contains a chemical or chemicals which can cause birth defects or other reproductive harm.
Toxicology data	If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification

Acute Toxicity

Name	Route	Species	Value
Boric acid	Dermal	Rabbit	LD50>2,000 mg/kg
Boric acid	Inhalation dust/mist (4hours)	Rat	LC50>2.12 mg/l
Boric acid	Ingestion	Rat	LD50 3,450 mg/kg

Skin Corrosion/Irritation

Name	Species	Value
Boric acid	Rabbit	No significant irritation

Serious eye damage/irritation

Name	Species	Value
Boric acid	Rabbit	Mild irritant

Skin sensitization

Name	Species	Value
Boric acid	Guinea pig	Not classified

Germ cell Mutagenicity

Name	Route	Value
Boric acid	In Vitro	Not mutagenic
Boric acid	In Vivo	Not mutagenic

Carcinogenicity

Name	Species	Value
Boric acid	Guinea pig	Not classified

Reproductive effects

Name	Route	Value	Species	Test result	Exposure duration
Boric acid	Ingestion	Toxic to female reproduction	Rat	NOAEL 100 mg/kg/day	3 generation
Boric acid	Ingestion	Toxic to female reproduction	Rat	NOAEL 100 Mg/kg/day	Generation
Boric acid	Ingestion	Toxic to development	Rabbit	NOAEL 125	during

Specific target Organ Toxicity – single exposure

Name	Route	Target Organs	Value	Species	Test result	Exposure duration
Boric acid	Inhalation	Respiratory system	Not classified	Human	NOAEL not available	Occupational exposure
Boric acid	Ingestion	Nervous system	Not classified	Rat	NOAEL 2000 Mg/kg	

Specific Target Organ Toxicity – repeated exposure

Name	Route	Target Organs	Value	Species	Test result	Exposure duration
Boric acid	Ingestion	Hematopoietic system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 100 mg/kg/day	12 years

Boric acid	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 400 Mg/kg/day	145 days
Boric Acid	Ingestion	heart I endocrine system I bone, teeth, nails, and/or hair I liver I nervous system I respiratory system	Not classified	Rat	NOAEL 334 mg/kg/day	2 years

12. ECOLOGICAL INFORMATION

Ecotoxicological information

Do not empty into drains.

Chemical fate information

Persistence in the environment is unlikely

13. DISPOSAL CONSIDERATIONS

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

14. TRANSPORT INFORMATION

DOT Not a hazardous material for transport.

IMDG Not a hazardous material for transport.

IATA Not a hazardous material for transport.

15. REGULATORY INFORMATION

US Federal Regulations:

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

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 311/312 Hazards Immediate (acute) health hazard; Delayed (chronic) health hazard

US State Regulations:

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

International Regulations: Contact local regulatory agencies for more information

U.S. Department of Transportation	Reportable Quantity (RQ): N DOT Marine Pollutant N DOT Severe Marine Pollutant N

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16. OTHER INFORMATION

This product is not radioactive. Data provided are those for the corresponding unlabeled compound, unless specifically indicated. Health and safety data for labeled compounds are assumed to be similar or identical to those for the corresponding unlabeled compounds.

Prepared By	ISOFLEX USA PO Box 472615 San Francisco CA 94147 United States
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Revision Note	Update supplier address

ISOFLEX USA's Commonly Used Abbreviations and Acronyms*

ACGIH	American Conference of Governmental Industrial Hygienists
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road
ALARA	As Low As Is Reasonably Achievable
AMU	Atomic Mass Unit
ANSI	American National Standards Institute
BLS	Basic Life Support
CAM	Continuous Air Monitor
CAS	Chemical Abstracts Service (division of the American Chemical Society)
CEN	European Committee for Standardization
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CLP	Classification, Labelling and Packaging (European Union)
CPR	Controlled Products Regulations (Canada)
CWA	Clean Water Act (USA)
DAC	Derived Air Concentration (USA)
DOE	United States Department of Energy (USA)
DOT	United States Department of Transportation (USA)
DSL	Domestic Substances List (Canada)
EC50	Half Maximal Effective Concentration
EINECS	European Inventory of Existing Commercial Chemical Substances
EHS	Environmentally Hazardous Substance
ELINCS	European List of Notified Chemical Substances
EMS	Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA	Environmental Protection Agency (USA)
EPCRA	Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986
GHS	Globally Harmonized System
HMIS	Hazardous Materials Identification System (USA)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IBC	Intermediate Bulk Containers
ICAO	International Civil Aviation Organization
IDLH	Immediately Dangerous to Life or Health
IMDG	International Maritime Code for Dangerous Goods
LC50	Lethal concentration, 50 percent
LD50	Lethal dose, 50 percent
LDLO	Lethal Dose Low
LOEC	Lowest-Observed-Effective Concentration
MARPOL	International Convention for the Prevention of Pollution from Ships
MSHA	Mine Safety and Health Administration (USA)

NCRP	National Council on Radiation Protection & Measurements (USA)
NDSL	Non-Domestic Substances List (Canada)
NFPA	National Fire Protection Association (USA)
NIOSH	National Institute for Occupational Safety and Health (USA)
NOEC	No Observed Effect Concentration
N.O.S.	Not Otherwise Specified
NRC	Nuclear Regulatory Commission (USA)
NTP	National Toxicology Program (USA)
OSHA	Occupational Safety and Health Administration (USA)
PBT	Persistent Bioaccumulative and Toxic Chemical
PEL	Permissible Exposure Limit
PIH	Poisonous by Inhalation Hazard
RCRA	Resource Conservation and Recovery Act (USA)
RCT	Radiation Control Technician
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe)
RID	Regulations Concerning the International Transport of Dangerous Goods by Rail
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act (USA)
TDG	Transportation of Dangerous Goods (Canada)
TIH	Toxic by Inhalation Hazard
TLV	Threshold Limit Value
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UN	United Nations (Number)
VOC	Volatile Organic Compound
vPvB	Very Persistent Very Bioaccumulative Chemical
WGK	Wassergefährdungsklassen (Germany: Water Hazard Classes)
WHMIS	Workplace Hazardous Materials Information System

*One or more of the above-listed items may not appear in this document.

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