

## Material Safety Data Sheet

# Boron Oxide Sputtering Target

Report No.: VIH240816009-1  
Version: 2.1  
Preparation Date: 08/16/2024  
Revision Date: 08/16/2024

## 1. Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Product Name	Boron Oxide
Product No.	050800ST
Formula	B <sub>2</sub> O <sub>3</sub>
CAS No.	1303-86-2
Synonyms	Diboron Trioxide

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

Identified uses	Laboratory chemicals, Scientific research
Uses advised against	Consulting manufacturers

### 1.3 Details of the supplier of the safety data sheet

Company Name	VI HALBLEITERMATERIAL GmbH
Street	Bergener Straße 14.,
City	Hannover
State	Niedersachsen
Zip Code	30625
Country	Germany
Tel	0049 1626484175
Email	info@vimaterial.de
Website	<a href="https://vimaterial.de/">https://vimaterial.de/</a>

### 1.4 Emergency telephone number

Emergency Phone #	0049 1626484175
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## 2. Hazards Identification

### 2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

### Physical hazards

Not Classified

### Health hazards

Reproductive toxicity	Category 1B (H360FD)
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### Environmental hazards

Not Classified

*Full text of Hazard Statements: see section 16*

## 2.2 Label elements

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

Signal Word	Danger
Pictograms	

### Hazard Statements

H360FD	May damage fertility. May damage the unborn child
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### Precautionary Statements

<b>Prevention</b>	
P201	Obtain special instructions before use
P280	Wear protective gloves/protective clothing.
<b>Response</b>	
P308 + P313	IF exposed or concerned: Get medical advice/attention

### 2.3 Other hazards

This product does not contain any substances classified as PBT or vPvB

This product does not contain any known or suspected endocrine disruptors.

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## 3. Composition/information on ingredients

### 3.1 Substances

Chemical Family	Ceramic
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Component	CAS No.	EC No.	Concentration
Boron Oxide (B <sub>2</sub> O <sub>3</sub> )	1303-86-2	215-125-8	<=100%

## 4. First aid measures

### 4.1 Description of first aid measures

General Treatment	If symptoms persist, call a physician. Show this Safety Data Sheet to the medical personnel.
Inhalation	Remove victim to fresh air. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions.
Skin	Take off immediately all contaminated clothing. Rinse skin with water/ shower. Seek medical attention.
Eyes	Rinse with pure water for at least 15 minutes. Remove contact lenses, if present and easy to do. Seek medical attention.
Ingestion	Do NOT induce vomiting. Seek medical attention.

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

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

1	Based on the symptoms that appear, provide targeted treatment.
2	Be aware that symptoms may be delayed.

## 5. Firefighting Measures

### 5.1 Extinguishing Media

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon
Unsuitable extinguishing media	N/A

### 5.2 Special hazards arising from the substance or mixture

1	Borane/boron oxides
2	Non-flammable.
3	Thermal decomposition can lead to release of irritating gases and vapors.

### 5.3 Advice for firefighters

1	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
2	Fight fire from a safe distance and with adequate protection. Do not allow firefighting water to enter drains or water courses.
3	Collect contaminated firefighting water separately.

## 6. Accidental Release Measures

### 6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Remove persons to safety. Use personal protective equipment as required. Avoid dust formation. Ensure adequate ventilation.
For emergency responders	Wear breathing apparatus if exposed to vapours/dust/spray/gases.

### 6.2 Environmental Precautions

1	Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.
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### 6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill	Covering of drains, Take up mechanically.
Advice on how to clean up a spill	Sweep up and shovel. Take care not to raise dust.
Other information relating to spills and releases	Place in appropriate containers for disposal. Ventilate affected area.

### 6.4 Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

## 7. Handling and Storage

### 7.1 Precautions for safe handling

Recommendations	Wear personal protective equipment/face protection. Ensure adequate ventilation. Use only under a chemical fume hood. Do not get in eyes, on skin, or on clothing. Avoid dust formation. Do not breathe (dust, vapor, mist, gas). Do not ingest. If swallowed then seek immediate medical assistance.
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Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.
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## 7.2 Conditions for safe storage, including any incompatibilities

Ventilation requirements	Keep containers tightly closed in a dry, cool and well-ventilated place
Storage class	Class 6.1D
Incompatible materials	See section 10.5

## 7.3 Specific end use(s)

Use in laboratories.

# 8. Exposure Controls/Personal Protection

## 8.1 Control parameters

### Exposure limits

Substance	CAS No.	Country / Regulation	Occupational Exposure Limit (OEL)	STEL (Short-Term Exposure Limit)
Boron oxide (B <sub>2</sub> O <sub>3</sub> )	1303-86-2	TRGS 900 (DE)	AGW (TWA): 1 mg/m <sup>3</sup> (i)	6 mg/m <sup>3</sup> (15 min average)
Boron oxide (B <sub>2</sub> O <sub>3</sub> )	1303-86-2	EU SCOEL	-	-
Boron oxide (B <sub>2</sub> O <sub>3</sub> )	1303-86-2	USA (ACGIH TLV)	TWA: 10 mg/m <sup>3</sup> (i, as borate glass dust)	STEL: 20 mg/m <sup>3</sup>
Boron oxide (B <sub>2</sub> O <sub>3</sub> )	1303-86-2	UK (EH40/2005)	WEL-TWA: 10 mg/m <sup>3</sup> (i), 4 mg/m <sup>3</sup> (r)	WEL-STEL: 20 mg/m <sup>3</sup> (i), 8 mg/m <sup>3</sup> (r)

Notes:

i: Inhalable fraction

r: Respirable fraction

TWA: Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

STEL: Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15- minute period (unless otherwise specified)

### Biological limit values:

No biological limit values established.

### Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

Exposure scenario	Route of exposure	Population	DNEL / DMEL value
chronic - systemic effects	inhalatory	worker (industry)	DNEL=4,66 mg/m <sup>3</sup>
chronic - systemic effects	dermal	worker (industry)	DNEL=220,6 mg/kg bw/day

### Predicted No-Effect Concentration (PNEC)

Exposure scenario	Organism	Environmental compartment	PNEC value
short-term (single instance)	aquatic organisms	freshwater	PNEC=2,9 mg/l
short-term (single instance)	aquatic organisms	marine water	PNEC=2,9 mg/l
short-term (single instance)	aquatic organisms	sewage treatment plant (STP)	PNEC=10 mg/l
short-term (single instance)	terrestrial organisms	soil	PNEC=5,7 mg/kg

## 8.2 Exposure controls

### Appropriate engineering controls

Ensure good general ventilation during machining operations.

### Personal protective equipment

#### Eye/face protection

Wear safety glasses with side shields (or goggles) (European standard - EN166) and face protection.

#### Skin protection

-Hand Protection

Protective gloves (The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.)

-Other protection measures

Wear appropriate protective gloves and clothing to prevent skin exposure. Wash hands thoroughly after handling.

### Respiratory Protection

Generally not required unless fine particulate matter is produced during grinding or polishing.

<b>Large scale/emergency use</b>	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced Recommended Filter type: Particulates filter conforming to EN 143
<b>Small scale/Laboratory use</b>	Maintain adequate ventilation.

## Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

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## 9. Physical and Chemical Characteristics

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### 9.1 Information on basic physical and chemical properties

Physical State	Solid
Colour	White
Odor	Odorless
Melting Point/Range	450 °C
Boiling Point/Range	1860 °C
Flammability (liquid)	Not applicable
Flammability (solid, gas)	No data available
Explosion limits	No data available
Flash Point	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
pH	No data available
Viscosity	Not applicable
Water Solubility	36 g/L (25°C)
Solubility in other solvents	No data available
Partition Coefficient (n-octanol/water)	No data available
Vapor Pressure	No data available
Density / Specific Gravity	2.46 g/cm <sup>3</sup>
Vapor Density	Not applicable
Particle characteristics	No data available

### 9.2 Other information

Molecular formula	B <sub>2</sub> O <sub>3</sub>
Molecular weight	69.61 g/mol
Evaporation Rate	Not applicable - Solid

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## 10. Stability and reactivity

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### 10.1 Reactivity

None known, based on information available

## 10.2 Chemical stability

Hygroscopic solid.

## 10.3 Possibility of hazardous reactions

**Hazardous Polymerization:** No information available

**Hazardous Reactions:** Violent reactions with: Fluorine, Halogenated hydrocarbons

## 10.4 Conditions to avoid

Exposure to moist air or water.

## 10.5 Incompatible materials

Strong oxidizing agents. Acids. Fluorine. Strong reducing agents.

## 10.6 Hazardous decomposition products

In the event of fire: see section 5

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## 11. Toxicological information

### 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	Oral:	No data available.
	Dermal:	No data available.
	Inhalation:	No data available.
Skin corrosion/irritation	No data available.	
Serious eye damage/irritation	No data available.	
Respiratory or skin sensitization	Respiratory	No data available.
	Skin	May cause an allergic skin reaction.
Germ cell mutagenicity	No data available.	
Carcinogenicity	No data available. There are no known carcinogenic chemicals in this product	
Reproductive toxicity	Reproductive Effects: May impair fertility. Developmental Effects: May cause harm to the unborn child.	
STOT - single exposure	No data available.	
STOT - repeated exposure	Inhalation - Causes damage to organs through prolonged or repeated exposure. - Lungs	
Aspiration hazard	Not applicable. Solid	

### 11.2 Information on other hazards

**Endocrine Disrupting Properties:** Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

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## 12. Ecological Information

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### 12.1 Toxicity

Ecotoxicity effects	No data available.
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### 12.2 Persistence and degradability

Persistence	No data available.
Degradability	No data available.

### 12.3 Bioaccumulative potential

Bioaccumulative potential	No data available.
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### 12.4 Mobility in soil

Mobility in soil	No data available.
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### 12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	In accordance with Annex XIII of the REACH Regulation, inorganic substances do not require assessment.
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### 12.6 Endocrine disrupting properties

Endocrine Disruptor Information	This product does not contain any known or suspected endocrine disruptors.
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### 12.7 Other adverse effects

Persistent Organic Pollutant	This product does not contain any known or suspected substance
Ozone Depletion Potential	This product does not contain any known or suspected substance

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## 13. Disposal Considerations

### 13.1 Waste treatment methods

Dispose of in accordance with all applicable local and national regulations. Use recovery/recycling where feasible, otherwise incineration is the recommended method of disposal. Empty containers may contain hazardous residues. Do not cut, puncture or weld on or near to the container. Labels should not be removed from containers until they have been cleaned. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers.

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## 14. Transport information

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### IMDG

14.1. UN number	Not applicable
14.2. UN Proper shipping name	Not classified as hazardous for transport.
14.3. Transport hazard class(es)	Not applicable
14.4. Packaging group	Not applicable

### ADR/RID/ADN

14.1. UN number	Not applicable
14.2. UN Proper shipping name	Not classified as hazardous for transport.
14.3. Transport hazard class(es)	Not applicable
14.4. Packaging group	Not applicable

### ICAO-IATA/DGR

14.1. UN number	Not applicable
14.2. UN Proper shipping name	Not classified as hazardous for transport.
14.3. Transport hazard class(es)	Not applicable
14.4. Packaging group	Not applicable

14.5. Environmental hazards	No hazards identified
14.6. Special precautions for user	No special precautions required
14.7. Maritime transport in bulk according to IMO instruments	Not applicable, packaged goods

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## 15. Regulatory information

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

This Safety Data Sheet is prepared in accordance with Commission Regulation (EC) 1907/2006, amended by Commission Regulation (EU) 2020/878.

#### Authorisations/Restrictions

Regulation (EC) 1907/2006, REACH, Annex XIV list of substances subject to authorisation: Not applicable

Regulation (EC) 1907/2006, REACH, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances:

Use restricted. See entry 30. (see link for restriction details) Use restricted. See entry 75. (see link for restriction details)

REACH Regulation (EC1907/2006) article 59 -Candidate List of Substances of Very High Concern (SVHC)

SVHC Candidate list -Toxic for reproduction(Article 57 c)

Regulation (EC) 1005/2009 on substances that deplete the ozone layer:

Not applicable

Regulation (EC) 850/2004 on persistent organic pollutants, amended by (EU) No 2019/1021:

Not applicable

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

REACH links

<https://echa.europa.eu/authorisation-list>

<https://echa.europa.eu/substances-restricted-under-reach>

<https://echa.europa.eu/candidate-list-table>

## 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

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## 16. Other information

### Revision information

Preparation date	08/16/2024
Revision date	08/16/2024
Revision reason	Creation.

### Abbreviations and acronyms

CAS	Chemical Abstracts Service
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
RID	Regulation concerning the International Carriage of Dangerous Goods by Rail
IATA	International Air Transportation Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal Concentration 50%
LD50	Lethal Dose 50%
TWA	Time Weighted Average

STOT	Specific target organ toxicity
PBT	Persistent, Bioaccumulative, Toxic
vPvB	Very Persistent, very Bioaccumulative
WEL	Workplace exposure limit

## References

- [1] CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- [2] ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>
- [3] eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: [http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- [4] Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- [5] HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- [6] IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- [7] IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- [8] ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

## List of relevant phrases (code and full text as stated in chapter 2 and 3)

H360FD	May damage fertility. May damage the unborn child
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## Disclaimer

The information of this safety data sheet is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products. For further information please contact [info@vimaterial.de](mailto:info@vimaterial.de).