

SAFETY DATA SHEETS (SDS)

1. PRODUCT IDENTIFICATION

PRODUCT NAME: **BORON CARBIDE**

SYNONYMS: B₄C, Norbide, Electrobor

CAS No.: 1303-86-2

RECOMMENDED USES: Boron carbide is used in wear parts such as blasting nozzles, various dies and ceramic body armor. As an abrasive it is ideal for lapping ceramics and ultrasonic cutting (machining). It is used as a neutron absorber in the nuclear industry and for reactor control rods. It is an anti-oxidant in carbon-bonded refractory mixes, and is used as a sintering aid in silicon carbide parts.

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2. HAZARD IDENTIFICATION

Classification of a Substance or Mixture:

- **Classification according to Regulation (EC) No 1272/2008**
The following Hazard Statements are applicable only according to OSHA regulations within the United States. These Statements are NOT applicable for the CLP regulation (1272/2008/EL) in the EU: H360



GHS08 Health Hazard

Repr. 1B, H360: May damage fertility or the unborn child.

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC:** Not applicable.
- **Information concerning particular hazards for human and environment:**
The product does not have to be labeled due to the calculation procedure of the “General Classification Guideline for preparation of the EU” in the latest valid version.
- **Classification System:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.
The classification is according to the latest editions of international substance lists, and is supplemented by information from technical literature and by information provided by the manufacturer.

Label Element:

- **Labelling according to Regulation (EC) No. 1272/2008:**
The substance is classified and labelled according to the Globally Harmonized System (GHS) within the USA.
This product does not have a classification according to the CLP regulation.
The product is classified and labelled according to the CLP regulation.

Hazard Pictograms: (Not applicable within the EU; only applicable for North America)



GHS08

Signal Word: DANGER

Not applicable within the EU; only applicable for North America

Hazard-determining Component of Labeling: diboron trioxide (B₂O₃)

Hazard Statements (Not applicable within the EU; only applicable for North America):

- H360 May damage fertility or the unborn child.
- The substance is classified and labeled according to the OSHA Globally Harmonized System (GHS) within the USA.

Precautionary Statements (Applicable only within the USA):

- P281: Use personal protective equipment as required.
- P202: Do not handle until all safety precautions have been read and understood.
- P308+P313: If exposed or concerned: Get medical advice/attention.
- P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

Additional Information: Restricted to professional users.

Hazard Description:

WHMIS Symbols (under old system): WHMIS System is being replaced by GHS System
D2A Very toxic material causing other toxic effects.



Classification System:

NFPA ratings (scale 0 - 4):



Health = 1

Fire = 0

Reactivity = 0

HMIS-Ratings (scale 0 - 4):

HEALTH	*1
FIRE	0
REACTIVITY	0

* Indicates a long term health hazard from repeated or prolonged exposures.

· **HMIS Long Term Health Hazard Substances**

1303-86-27 diboron trioxide (B₂O₃)

Other Hazards:

Results of PBT and vPvB Assessment

- **PBT:** Not applicable.
- **vPvB:** Not applicable.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Mixtures:

- **Description:** Mixture of substances listed below with nonhazardous additions.


- **Dangerous Components:**


CAS No.: 1303-86-2

EINEC: 215-125-8

Index No.: 005-008-00-8

Diboron trioxide (B₂O₃) ≤ 3%

 T Repr. Cat. 2 R60-61

 Repr. 1B, H360FD

CAS No.: 7439-89-6

EINECS: 231-096-4

Iron ≤ 1%

Substance with a Community workplace exposure limit

SVHC:

CAS No.: 1303-86-2

diboron trioxide (B₂O₃) < 3%

- **Additional Information:** For the wording of the listed risk phrases refer to Section 16.

4. FIRST-AID MEASURES

Description of First Aid Measures (No special measures required):

- **If Swallowed:** Rinse out mouth and drink plenty of water. Do not induce vomiting; immediately call for medical help.
- **If on Skin:** Brush off loose particles. Wash with soap and water. If skin irritation is experienced, consult a doctor.
- **If in Eyes:** Remove contacts if possible if worn. Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **If Inhaled:** If breathing is difficult - Remove person to fresh air and keep comfortable for breathing.
If experiencing respiratory symptoms or feels unwell - Seek immediate medical attention.

Most important symptoms and effects, both acute and delayed:

- Coughing
- Gastric or intestinal disorders
- Breathing difficulty

Hazards:

- Danger of impaired breathing.
- May damage fertility or the unborn child.

Indication of any immediate medical attention and special treatment needed:

- Contains boron compounds.

5. FIRE FIGHTING MEASURES

- **FLASH POINT:** Not Applicable
- **FLAMMABLE LIMITS:** **LEL:** Not Applicable **UEL:** Not Applicable
- **AUTO IGNITION TEMPERATURES:** Not Applicable.
- **EXTINGUISHING MEDIA:** Use media appropriate for surrounding conditions.
- **FIRE AND EXPLOSION HAZARDS:** Non-flammable, non-combustible. Product will not burn.
- **HAZARDOUS DECOMPOSITION PRODUCTS:** None
- **FIRE FIGHTING INSTRUCTIONS:** Wear self-containing respiratory protective device. Wear fully protective suit.
- **NFPA CLASSIFICATION:** **HEALTH:** 1 **FLAMMABILITY:** 0 **REACTIVITY:** 0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

- Use respiratory protective device against the effects of fumes/dust/aerosol.
- For large spills, wear protective clothing.
- Avoid formation of dust.
- Ensure adequate ventilation.

Environmental precautions: Prevent seepage into sewage system, work pits and cellars.

Methods and material for containment and cleaning up:

- Pick up mechanically.
- Dispose contaminated material as waste according to Section 13.
- Do not flush with water or aqueous cleansing agents.

Reference to other sections:

- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for disposal information.

7. HANDLING AND STORAGE

Precautions for safe handling:

- Prevent formation of dust.
- Any unavoidable deposit of dust must be regularly removed.
- Use only in well ventilated areas.
- Avoid breathing dust.
- Do not dry clean dust covered objects and floors. Wash thoroughly with plenty of water.

Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities:

Storage:

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:

- Store away from oxidizing agents.
- Store away from foodstuffs.
- Do not store together with acids.

Further information about storage conditions:

- Store in cool, dry conditions in well-sealed receptacles.
- Store receptacle in a well ventilated area.
- Protect from humidity and water.

Specific end use(s) No further relevant information available.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Additional information about design of technical facilities: No further data – see Section 7.

CONTROL PARAMETERS:

Ingredients with Limit Values That Require Monitoring at the Workplace:

Diboron trioxide (Cas# 1303-86-2):

PEL (USA) Long-term value: 15* mg/m³
*Total dust

REL (USA) Long-term value: 10 mg/m³

TLV (USA) Long-term value: 10 mg/m³

EL (Canada) Long-term value: 10 mg/m³

EV (Canada) Long-term value: 10 mg/m³

Iron (CAS# 7439-89-6):

EV (Canada) Long-term value: 1*, 5** mg/m³
As iron; *salts, water-soluble; **welding fume

Additional information: The lists that were valid during the creation were used as basis.

EXPOSURE CONTROLS:

Personal Protective Equipment (PPE):

General Protective and Hygienic measures:

- The usual precautionary measures for handling chemicals should be followed.
- Keep away from foodstuffs, beverages and feed.
- Wash hands before breaks and at the end of work.
- Avoid contact with the eyes.
- Avoid close or long term contact with the skin.
- Do not inhale dust / smoke / mist.
- Pregnant women should strictly avoid inhalation or skin contact.

Respiratory Protection:

- Suitable respiratory protective device recommended.
- Use suitable respiratory protective device in case of insufficient ventilation.
- For spills, respiratory protection may be advisable.

Protection of Hands:

- Wear gloves for the protection against mechanical hazards according to OSHA, NIOSH or EN rules.
- Gloves are advised for repeated or prolonged contact.
- The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Material of Gloves:

- The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Penetration Time of Glove Material:

- The exact break through time has to be found out by the glove manufacturer and has to be observed.

Eye protection:

- Safety glasses or goggles to prevent dust and particles from entering the eye.

Body protection:

- Not required under normal conditions of use.
- Protection may be required for spills.

Limitation and supervision of exposure into the environment:

- No special requirements.

Risk management measures:

- No special requirements (see section 7 for additional information.).

9. PHYSICAL AND CHEMICAL PROPERTIES
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Information on basic physical and chemical properties:**GENERAL INFORMATION:**

- **Appearance:**
 - **Form:** Granulate
 - **Color:** Black
- **Odor:** Odorless
- **Odor threshold:** Not determined.
- **pH-value:** Neutral
- **Change in condition**
 - **Melting point/Melting range:** 2350 °C (4262 °F)
 - **Boiling point/Boiling range:** Undetermined.
- **Flash point:** Not applicable.
- **Flammability (solid, gaseous):** Product is not flammable.
- **Auto-ignition temperature:** Not determined.
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Not determined.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
 - **Lower:** Not determined.
 - **Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density at 20 °C (68 °F):** **2.52 g/cm³**
- **Relative density** Not determined.
- **Vapor density** Not applicable.
- **Evaporation rate** Not applicable.
- **Solubility in / Miscibility with**
 - **Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - **Dynamic:** Not applicable.
 - **Kinematic:** Not applicable.

OTHER INFORMATION:**No further relevant information available.**

10. STABILITY AND REACTIVITY

Reactivity:

Chemical Stability:

- **Thermal decomposition / conditions to be avoided:** No decomposition if used and stored according to specifications.

Possibility of hazardous reactions:

- Reacts with strong acids.
- Reacts with oxidizing agents.
- Reacts with strong alkali.

Conditions to avoid: No further relevant information available.

Incompatible materials: No further relevant information available.

Hazardous decomposition products: Carbon monoxide and carbon dioxide

11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS:

Acute toxicity:

Primary Irritant Effect:

- **On the skin:** No irritant effect.
- **On the eye:** No irritating effect.

Sensitization: No sensitizing effects known.

Additional Toxicological Information:

- Product is suspected to cause damage to fertility.
- Product is suspected to cause birth defects.

CMR Effects: (carcinogenicity, mutagenicity and toxicity for reproduction):

- Classification for the United States only.
- Repr. 1B

12. ECOLOGICAL INFORMATION

TOXICITY:

- **Aquatic Toxicity:** No further relevant information available.
- **Persistence & Degradability:** No further relevant information available.

BEHAVIOR IN ENVIRONMENTAL SYSTEM:

- **Bioaccumulative Potential:** No further relevant information available.
- **Mobility In Soil:** No further relevant information available

ADDITIONAL ECOLOGICAL INFORMATION:

General Notes:

- Water Hazard Class 2 (German Regulation) (self-assessment): hazardous for water
- Danger to drinking water if even small quantities leak into the ground.
- Due to available data on eliminability/decomposition and bioaccumulation, potential prolonged term damage of the environment cannot be excluded.

Results of PBT and vPvB Assessment:

- **PBT:** Not applicable.
- **vPvB:** Not applicable.

Other Adverse Effects: No further relevant information available

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods:

Recommendation:

- Smaller quantities can be disposed of with household waste.
- Can be reused after reprocessing.
- Contact waste processors for recycling information.
- The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes. Residual materials should be treated as hazardous.

Uncleaned Packaging:

Recommendation:

- Disposal must be made according to official regulations.

14. TRANSPORT INFORMATION

UN-Number

DOT, ADR, ADN, IMDG, IATA: Not Regulated

UN proper shipping name

DOT, ADR, ADN, IMDG, IATA Not Regulated

Transport hazard class(s)

DOT, ADR, ADN, IMDG, IATA
Class Not Regulated

Packing group

DOT, ADR, IMDG, IATA Not Regulated

Environmental hazards:

Marine pollutant: No

Special precautions for user

Not applicable.

**Transport in bulk according to Annex II of
MARPOL73/78 and the IBC Code**

Not applicable.

UN "Model Regulation":

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15. REGULATORY INFORMATION

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

United States (USA)

SARA

- **Section 355 (extremely hazardous substances):** None of the ingredients are listed.
- **Section 313 (Specific toxic chemical listings):** None of the ingredients are listed.
- **TSCA (Toxic Substances Control Act):** All ingredients are listed.

Proposition 65 (California):

- **Chemicals known to cause cancer:** None of the ingredients are listed
- **Chemicals known to cause reproductive toxicity for females:** None of the ingredients are listed.
- **Chemicals known to cause reproductive toxicity for males:** None of the ingredients are listed.
- **Chemicals known to cause developmental toxicity:** None of the ingredients are listed.

Carcinogenic Categories:

- **EPA (Environmental Protection Agency):** diboron trioxide, CAS# 1303-86-2
- **IARC (International Agency for Research on Cancer):** None of the ingredients are listed.
- **TLV (Threshold Limit Value established by ACGIH):** None of the ingredients are listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health):** None of the ingredients are listed.
- **State Right to Know Listings:** Substance is not listed.

Canadian substance listings:

- **Canadian Domestic Substances List (DSL):** All ingredients are listed.
- **Canadian Ingredient Disclosure list (limit 0.1%):** None of the ingredients are listed.
- **Canadian Ingredient Disclosure list (limit 1%):** diboron trioxide, CAS# 1303-86-2

Other regulations, limitations and prohibitive regulations:

- This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Substances of very high concern (SVHC) according to REACH, Article 57:

- diboron trioxide, CAS# 1303-86-2

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION & LAST REVISION DATE

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant Phrases:

- H360FD May damage fertility. May damage the unborn child.
- R60 May impair fertility.
- R61 May cause harm to the unborn child.

Abbreviation and Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstracts Service
CARC. 1A	Carcinogenicity, Hazard Category 1A
DNEL	Derived No-Effect Level (REACH)
DOT	Department of Transportation
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
GHS	Globally harmonized System of Classification and Labeling of Chemicals.
HMIS	Hazardous Materials Identification System (USA)
IARC	International Agency for Research on Cancer
IMDG	International Maritime Dangerous Goods
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PNEC	Predicted No-effect Concentration (REACH)
Repr. 1B	Reproductive toxicity, Hazard Category 1B
SARA	Superfund Amendment and Reauthorization Act

TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
WHMIS	Workplace hazardous Materials Information System (Canada)

NOTICE:

This material safety data sheet complements the technical data sheets but does not replace them. The information it contains is based on our present knowledge of the product on the date indicated. It is given in good faith. Users should be warned about the risks associated with using the product for a different purpose than that for which it was developed, and particularly for uses for which we are not qualified to give advice.

These regulatory prescriptions are provided with a view to helping users meet their obligations when using this product. This list should not be considered exhaustive and does not exempt users from ensuring that they are not required to comply with any further prescriptions other than those mentioned above concerning product possession and handling for which they are solely responsible.

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