

MATERIAL SAFETY DATA SHEETS

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1. PRODUCT IDENTIFICATION/DESCRIPTION

PRODUCT NAME: Boron Carbide
SYNONYMS: Boron Carbide
FORMULA: B₄C (>89%)

2. COMPOSITION

Ingredient	CAS#	Weight(%)	PEL-OSHA (mg/m³)	TLV-ACGIH (mg/m³)	Carcinogen (Y/N)
Boron Carbide (B ₄ C)	12069-32-8	min. 89%	6 (8 Hr TWA)	10	N
Total Dust					

*Materials are regulated under OSHA 29 CFR 1900.1200, Hazard Communication Standard.
*Source of exposure limit data; ACGIH Threshold Limit Values; (OSHA Tables Z-1-A, Z-2, Z-3).
*All ingredients are listed under TSCA.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Non-flammable black solid or powder. Abrasive particulate may cause minor eye and skin irritation. Inhalation of high concentrations may cause transient upper respiratory irritation. Product is non-combustible and stable.

Primary Route(s) of Entry: *Inhalation:* Yes *Skin:* No *Ingestion:* No *Other:* No

POTENTIAL HEALTH EFFECTS

Acute:

EYE: Dusts may cause minor irritation. Particulate matter may scratch the cornea or cause other mechanical injury to the eye.

SKIN: May cause minor irritation. Not absorbed through skin.

INGESTION: Relatively non-toxic. Ingestion is not anticipated under normal working conditions.

INHALATION: Product will act as a nuisance dust. Inhalation of high concentrations of dust may cause coughing and mild, transitory respiratory irritation. May cause slight to moderate irritation of mucous membranes.

Chronic:

INHALATION: Long-term dust inhalation in excess of the PEL or TLV may decrease the ability of the lungs to clear particulate matter which may cause shortness of breath and increased susceptibility to respiratory disease.

SIGNS AND SYMPTOMS: Irritation, redness, pain, tear formation, blurred vision, light sensitivity, shortness of breath, decreased chest expansion, dry cough, and fatigue.

Medical Conditions Aggravated by Exposure: Repeated inhalation of dusts over time may aggravate pre-existing respiratory disease. Precautions should be taken to alleviate the pre-existing medical condition.

TARGET ORGANS: Lungs

CARCINOGENICITY: **NTP:** No **IARC:** No **OSHA:** No **ACGIH:** No

4. FIRST AID MEASURES

EYES: Flush eyes with lukewarm water for 15 minutes, opening and closing eyelids to ensure adequate rinsing. If redness, irritation, pain, or tearing occurs, seek medical attention.

SKIN: Wash contaminated area with soap and water. Wash contaminated clothing. Seek medical attention if symptoms persist.

INHALATION: If inhalation of high concentrations occurs, move to fresh air. If breathing has stopped, a certified professional should give CPR. Seek immediate medical attention.

INGESTION: Do not induce vomiting unless suggested by a doctor. Seek medical attention.

5. FIRE FIGHTING MEASURES

FLASH POINT: Not Applicable

FLAMMABLE LIMITS: LEL: Not Applicable UEL: Not Applicable

AUTO IGNITION TEMPERATURES: Not Applicable.

EXTINGUISHING MEDIA: Conventional extinguisher (water, powder). Use media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARDS: Fines can cause dust explosion. Keep away from sources of ignition. ~9um and finer can ignite and smoldering fire can spread. Burning test result for <5um shows BZ4. Dust explosion test shows St0-1 (according to VD1/2263).

HAZARDOUS DECOMPOSITION PRODUCTS: None

FIRE FIGHTING INSTRUCTIONS: Firefighters should wear a NIOSH/MSHA approved full-faced self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or bunker gear.

6. ACCIDENTAL RELEASE MEASURES

Isolate hazard area and deny entry to unauthorized and/or unprotected personnel. Avoid dust generation. Water mist may be added as necessary to control the level of airborne dusts. Respiratory protection for clean-up personnel depends on the level of exposure anticipated. (See Section 8. *EXPOSURE CONTROLS/PERSONAL PROTECTION*) Gently shovel or scoop into clean dry container for later recycle or disposal. Comply with Federal, State and Local regulations regarding reporting of spills and disposal.

7. HANDLING AND STORAGE

Store in dry area in closed containers. Storage and work areas should be periodically cleaned to minimize dust accumulation. Avoid dust inhalation and promulgation. DO NOT use compressed air or dry sweeping to remove dust from work area. Dusts should be removed using an appropriately equipped vacuum. Exhaust air should be filtered through a HEPA (high-efficiency particulate air) filter. If an appropriate vacuum is unavailable, only wet clean-up methods should be used (i.e. wet sweeping, misting, etc.) Moisture should be added as necessary to reduce exposure to airborne respirable dust. See OSHA 29 CFR 1910.94 (Ventilation) and 29 CFR 1910.1000 (Air Contaminants).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Under normal working conditions, below acceptable exposure guidelines, none is required. For concentrations above the PEL but less than 10X the PEL, a NIOSH/MSHA approved dust mist respirator should be worn. Appropriate respirator selection will be dependent upon the magnitude of exposure and should be selected in accordance with 29 CFR 1910.134. (See Section 2. *COMPOSITION* for PEL's and TWA's).

SKIN PROTECTION: Protective gloves, as needed, to prevent skin contact.

EYE PROTECTION: Safety-glasses with side shields or goggles to prevent dust and particles from entering the eye. See OSHA 29 CFR 1910.133.

OTHER: Under dusty conditions, employees should wear coveralls or other suitable work clothing. Contaminated clothing must be vacuumed before removal. DO NOT REMOVE dust from clothing by blowing or shaking.

ENGINEERING CONTROLS: Use general ventilation. Local exhaust may be necessary for processes which generate large quantities of airborne dust. Keep exposures below applicable OSHA PEL's and ACGIH-TLV's.

9. PHYSICAL PROPERTIES

Formula	B ₄ C
Boiling Point	Not Applicable
Melting Point	Not Applicable
Specific Gravity (H ₂ O = 1)	2.51
Evaporation Rate	None
Solubility in Water	Insoluble
Solubility in Alcohol	Insoluble
pH (10% slurry)	Not applicable
Appearance/Odor	Black solid or powder/odorless

10. STABILITY AND REACTIVITY

STABILITY: Stable under normal ambient conditions of temperature and pressure.

REACTIVITY/INCOMPATIBILITY: Boron Carbide is oxidized by hot oxidizing acids (HNO₃, H₂SO₄, HClO₄).

HAZARDOUS DECOMPOSITION: Boron Oxide

HAZARDOUS POLYMERIZATION: Will not occur.

11. DISPOSAL CONSIDERATIONS

Dispose of according to applicable federal, state, and local regulations. Dispose per 40 CFR 261 and 262.

12. TRANSPORT INFORMATION

Not regulated as a hazardous material by DOT.

13. KEY

ACGIH	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstracts Service
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
MSHA	Mine Safety and Health Administration
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
SARA	Superfund Amendment and Reauthorization Act
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act

14. DISCLAIMER

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