



# MATERIAL SAFETY DATA SHEET

## FERROBORON

### SECTION I – PRODUCT IDENTIFICATION

**Trade Name:** Ferroboron, Ferroboron alloy  
**Formula:** FeB  
**Manufacturer's Name:** Miller and Company LLC  
**Address:** 9700 W. Higgins Road  
Suite 1000  
Rosemont, IL 60018  
**Phone:** 874-696-2400  
**Emergency Phone:** Chemtrec 800-262-8200  
**Prepared by:** H. F. Linebarger  
**Date:** June 27, 2013

### SECTION II – COMPOSITION

<u>Component</u>	<u>% by Weight</u>	<u>CAS No.</u>	<u>OSHA PEL<sup>1</sup></u> <u>(mg/m<sup>3</sup>)</u>	<u>ACGIH</u> <u>TLV<sup>2</sup></u>
Boron	17.5 – 19.0	7440-42-8	NA	NA
Iron	70.0 – 85.0	7439-89-6	NA	NA
Silicon	0-2.0	7440-21-3	10	10
Carbon	0-1.5	7440-44-0	5	NA
Aluminum	0-0.5	7429-90-5	15	10

<sup>1</sup> Occupational Safety and Health Final Rule Permissible Exposure Limits

<sup>2</sup> American Conference of Governmental Industrial Hygienist thresh hold Limit Values

### SECTION III – PHYSICAL DATA

**Appearance:** Silver gray metallic. Odorless  
**Specific Gravity:** 6.4 gm/cc (approximate)  
**Melting Point:** Liquidus ~ 1540° C at 16% B  
Solidus ~ 1390° C at 16% B

### SECTION IV – HAZARDS IDENTIFICATION

#### \*\*\*POTENTIAL EALTHFFECTS\*\*\*

**Target organs:** Lungs (dust), eyes, skin.

**Signs and symptoms of short-term (acute) exposure:**

**Inhalation:** Dust may cause irritation to the lungs and respiratory system (throat, pneumoconiosis).

**Skin contact:** Dust may cause irritation.

**Eye contact:** Contact with dust may cause mechanical irritation and conjunctivitis.

**Ingestion:** May be harmful if ingested, but unlikely.

**Effects of long-term (chronic) exposure:** N/Av

**Other important hazards:** Refer to Section 12.

### SECTION V – FIRST AID MEASURES

**Inhalation:** Remove victim to fresh air. Give oxygen if breathing is difficult. If breathing has stopped, begin artificial respiration. Obtain medical attention.

**Skin contact:** Wash skin with soap and water while removing contaminated clothing. If irritation develops consult a physician.

**Eye contact:** Immediately flush eyes with copious amounts of water for at least 15 minutes. If irritation develops consult a physician.

**Ingestion:** Unlikely route of exposure. Obtain medical attention.

## SECTION VI – FIRE FIGHTING MEASURES

**Fire hazards/conditions of flammability:** Fires or explosions may be initiated by exposing any concentrated dust suspension (finer than minus 100 mesh) in an enclosed industrial area to a spark or flame. When in the powder form, this product may heat spontaneously and form flammable hydrogen gas if moisture is present. Lump is non combustible.

**Flash point (Method):** N/Ap

**Lower flammable limit (% by volume):** N/Ap

**Upper flammable limit (% by volume):** N/Ap

**Explosion data:** *Sensitivity to mechanical impact:* N/Av

*Sensitivity to static discharge:* N/Av

**Oxidizing properties:** N/Av

**Auto-ignition temperature:** N/Av

**Suitable extinguishing media:** Do not use water. Use dry chemical or dry sand or CO<sup>2</sup> to smother fire.

**Special fire-fighting procedures/equipment:** Firefighters should wear proper protective equipment and self-contained breathing apparatus where exposure to toxic fumes is possible. Fire may be isolated and allowed to burn itself out. Do not disturb burning metal while extinguishing the fire.

**Unusual fire and explosion hazards:** N/Av

**Hazardous combustion products:** Small amount of hydrogen may be produced in the presence of moisture. Oxides of iron, boron and aluminum.

## SECTION VII – ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Avoid dust cloud formation. Keep dust away from sources of ignition. Wear personal protective equipment during cleanup. Restrict access to area until completion of clean-up. All persons dealing with clean-up should wear the appropriate protective equipment especially where exposure to dust or fume is possible. Take precautions to prevent fumes from coming in contact with employee clothing.

**Environmental precautions:** If dusts are present, ensure dusts do not enter air. Notify the appropriate authorities as required.

**Spill response/Cleanup:** Use clean-up procedure that minimizes exposure to dust. Place all dry material in a closed container.

**Prohibited materials:** None known.

## SECTION VIII – HANDLING AND STORAGE

**Safe handling procedures:** Avoid and control operations which create dusting. Do not breathe fumes or dust. Use with adequate ventilation. Keep away from moisture. Avoid contact with eyes, skin and clothing. Wear suitable protective equipment. Training the workers on the potential health hazards associated with product dust or fume is important. Enclosures, ventilation systems, engineering controls, or respiratory protective equipment should be utilized where inhalation exposure in excess of the limits is a possibility. Secondary inhalation exposures could occur when removing or laundering the clothing.

**Storage requirements:** Store in a cool, dry area away from incompatible materials.

**Incompatible materials:** Acids, strong oxidizers, strong bases and moisture,

## SECTION IX – EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Ventilation and engineering controls:** Use general or local exhaust ventilation to meet TLV requirements.

**Respiratory protection:** Respiratory protection is required if the airborne dust concentration exceeds the TLV and PEL levels. Use NIOSH/MSHA approved dust respirators.

**Protective gloves:** Impervious gloves appropriate to the material if skin contact with dusts is expected. Advice should be sought from glove suppliers.

**Eye protection:** Safety glasses. Safety goggles for extended usage.

**Other protective equipment:** Where exposure to dust or fume is possible use protective clothing, eyewash fountain and safety shower

**Permissible exposure levels:** See Section 2.

## SECTION X – PHYSICAL AND CHEMICAL PROPERTIES

**Physical form, color, and odor:** Solid, Silver gray metallic lump or powder. No odor.

**Odor threshold:** N/Ap

**pH:** N/Ap

**Boiling point:** N/A v

**Vapor pressure:** N/Av

**Solubility in water:** Insoluble, negligible.

**Coefficient of oil/water distribution:** N/Av

**Vapor density:** N/Ap

**Volatile organic compounds (VOC's):** N/Av

**Evaporation rate:** N/Ap

**Percent Volatile by Weight:** N/Av

## SECTION XI – REACTIVITY AND STABILITY DATA

**Stability and reactivity:** Stable under the recommended storage and handling conditions prescribed. Hazardous polymerization will not occur.

**Conditions to avoid:** Stable under ambient pressure and temperature.

**Materials to avoid:** Incompatible materials (see Section 5).

**Hazardous decomposition products:** Small amount of hydrogen may be produced in the presence of moisture. Oxides of iron, boron, and aluminum.

## SECTION XII – TOXICOLOGICAL INFORMATION

**LC<sub>50</sub>:** See Section 2

**Routes of exposure:** Eye contact, skin contact, inhalation.

**Toxicological data:** This product may cause mild irritation as a nuisance dust to skin, eyes and respiratory tract.

**Carcinogenicity:** No ingredient listed by IARC and ACGIH as carcinogenic.

**Teratogenicity, mutagenicity, other reproductive effects:** N/Av

**Sensitization to material:** N/Av

**Synergistic materials:** N/Av

## SECTION XIII – ECOLOGICAL INFORMATION

**Environmental effects:** This product is insoluble in water. The product should not be allowed to enter drains or water courses or be deposited where it can affect localized environmental conditions.

**Important environmental characteristics:** N/Av

**Aquatic toxicity:** There is no data available on the product itself.

## SECTION XIV – WASTE DISPOSAL

**Handling for disposal:** Handle waste according to recommendations in Section 7.

**Methods of disposal:** Dispose in accordance with all applicable federal, provincial and local regulations.

## SECTION XV – TRANSPORTATION INFORMATION

**Transportation of Dangerous Goods Clear Language (CLR) information:** This product is not regulated.

## SECTION XVI – REGULATORY INFORMATION

**WHMIS information:**

**In powder form:** Class B6 - Reactive Flammable Materials; Class D2B- Materials Causing Other Toxic Effects, Toxic Material.

**In solid lump form:** Class D2B - Materials Causing Other Toxic Effects, Toxic Material

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

CEPA information: All ingredients are listed on the DSL/NDSL.

TSCA information: All ingredients are listed on the TSCA inventory.