SECTION 1. IDENTIFICATION

<table>
<thead>
<tr>
<th>GHS product identifier</th>
<th>Boron Carbide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other means of identification</td>
<td>Boron Carbide, Reaction Bonded Boron Carbide</td>
</tr>
<tr>
<td>Product Type</td>
<td>Solid</td>
</tr>
<tr>
<td>Supplier's details</td>
<td>CoorsTek, Inc.</td>
</tr>
<tr>
<td></td>
<td>14143 Denver West Parkway, Suite 400</td>
</tr>
<tr>
<td></td>
<td>Golden, CO 80401</td>
</tr>
<tr>
<td></td>
<td>Phone: +1 303 271 7100</td>
</tr>
<tr>
<td></td>
<td>Fax: +1 303 271 7009</td>
</tr>
<tr>
<td>Emergency telephone number</td>
<td>+1 303 271 7100</td>
</tr>
<tr>
<td>(with hours of operation)</td>
<td>8am-5pm MDT (M-F)</td>
</tr>
</tbody>
</table>

SECTION 2. HAZARDS IDENTIFICATION

| OSHA/HCS status | While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product. |
| Classification of the substance or mixture | Not classified |

GHS LABEL ELEMENTS

<table>
<thead>
<tr>
<th>Signal word</th>
<th>No signal word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard statements</td>
<td>No known significant effects or critical hazards</td>
</tr>
</tbody>
</table>

PRECAUTIONARY STATEMENTS

| Prevention | Not applicable |
| Response   | Not applicable |
| Storage    | Not applicable |
| Disposal   | Not applicable |
| Hazards not otherwise classified | None known |
SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture: Mixture
Other means of identification: Boron Carbide, Reaction Bonded Boron Carbide

CAS NUMBER/OTHER IDENTIFIERS

- **CAS number**: Not applicable
- **Product code**: Not available

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>%</th>
<th>CAS NUMBER</th>
</tr>
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<tbody>
<tr>
<td>Boron carbide</td>
<td>75 - 100</td>
<td>12069-32-8</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>5 - 10</td>
<td>1344-28-1</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4. FIRST AID MEASURES

DESCRIPTION OF NECESSARY FIRST AID MEASURES

- **Eye contact**: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- **Inhalation**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- **Skin contact**: Flush contaminated skin with plenty of water. Get medical attention if symptoms occur.
- **Ingestion**: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
SECTION 4. FIRST AID MEASURES, CONTINUED

MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE AND DELAYED

Potential acute health effects

- **Eye contact**: No known significant effects or critical hazards
- **Inhalation**: No known significant effects or critical hazards
- **Skin contact**: No known significant effects or critical hazards
- **Ingestion**: No known significant effects or critical hazards

Over-exposure signs/symptoms

- **Eye contact**: No known significant effects or critical hazards
- **Inhalation**: No known significant effects or critical hazards
- **Skin contact**: No known significant effects or critical hazards
- **Ingestion**: No known significant effects or critical hazards

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED, IF NECESSARY

- **Notes to physician**: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- **Specific treatments**: No specific treatment
- **Protection of first-aiders**: No action shall be taken involving any personal risk or without suitable training.
  See toxicological information (Section 11)
SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Suitable extinguishing media
Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media
None known

Specific hazards arising from the chemical
No specific fire or explosion hazard

Hazardous thermal decomposition products
Decomposition products may include the following materials:
carbon dioxide,
carbon monoxide
metal oxide/oxides

Special protective actions for firefighters
No special protection is required.

Special protective equipment for firefighters
Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT & EMERGENCY PROCEDURES

For non-emergency personnel
No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders
If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil, or air).

METHODS & MATERIALS FOR CONTAINMENT AND CLEANING UP

Spill
Move containers from spill area. Prevent entry into sewers, water courses, basements, or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.
SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

Protective measures
Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene
Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash hands and face before eating, drinking, and smoking. See Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities
Store in accordance with local regulations. Do not store in unlabeled containers. Store in a cool, dry location. Any dust generated during handling or processing should be removed by wet mopping or vacuuming.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS

Occupational exposure limits
None

Appropriate engineering controls
Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls
Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

INDIVIDUAL PROTECTION MEASURES

Hygiene measures
Wash hands, forearms, and face thoroughly after handling chemical products, and before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection
Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases, or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side shields.

SKIN PROTECTION

Hand protection
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION, CONTINUED**

- **Other skin protection**: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

- **Respiratory protection**: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

**APPEARANCE**

- **Physical state**: Solid
- **Color**: Black
- **Odor**: Not available
- **Odor threshold**: Not available
- **pH**: Not applicable
- **Melting point**: >1800° C (>3272° F)
- **Boiling point**: >1800° C (>3272° F)
- **Flash point**: Not available
- **Evaporation rate**: Not available
- **Flammability (solid, gas)**: Material does not burn.
- **Lower and upper explosive (flammable) limits**: Not available
- **Vapor pressure**: Not applicable
- **Vapor density**: Not applicable
- **Relative density**: 3.7
- **Solubility**: Insoluble in the following materials: cold water and hot water
- **Partition coefficient: n- octanol/water**: Not applicable
SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES, CONTINUED

Auto-ignition temperature  Not available
Decomposition temperature Not available
Viscosity Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity No specific test data related to reactivity available for this product or its ingredients.
Chemical stability The product is stable.
Possibility of hazardous reactions Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid None known
Incompatible materials Reactive or incompatible with the following materials: oxidizing materials
Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity No data available
Irritation/Corrosion No data available
Sensitization No data available
Mutagenicity No data available
Carcinogenicity

<table>
<thead>
<tr>
<th>NAME</th>
<th>OSHA</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>EPA</th>
<th>NIOSH</th>
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<tbody>
<tr>
<td>Aluminum oxide</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>A4</td>
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Reproductive toxicity No data available
Teratogenicity No data available
Specific target organ toxicity (single exposure) No data available
Specific target organ toxicity (repeated exposure) No data available
SECTION 11. TOXICOLOGICAL INFORMATION, CONTINUED

Aspiration hazard
No data available

Information on the likely routes of exposure
Inhalation

POTENTIAL ACUTE HEALTH EFFECTS

Eye contact
No known significant effects or critical hazards

Inhalation
No known significant effects or critical hazards

Skin contact
No known significant effects or critical hazards

Ingestion
No known significant effects or critical hazards

SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS

Eye contact
No known significant effects or critical hazards

Inhalation
No known significant effects or critical hazards

Skin contact
No known significant effects or critical hazards

Ingestion
No known significant effects or critical hazards

DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT AND LONG TERM EXPOSURE

Short term exposure
No known significant effects or critical hazards

Potential immediate effects
No known significant effects or critical hazards

Potential delayed effects
No known significant effects or critical hazards

Long term exposure
No known significant effects or critical hazards

Potential immediate effects
No known significant effects or critical hazards

Potential delayed effects
No known significant effects or critical hazards

Potential chronic healthy effects
No known significant effects or critical hazards

General
No known significant effects or critical hazards

Carcinogenicity
No known significant effects or critical hazards
SECTION 11. TOXICOLOGICAL INFORMATION, CONTINUED

- **Mutagenicity**: No known significant effects or critical hazards
- **Teratogenicity**: No known significant effects or critical hazards
- **Developmental effects**: No known significant effects or critical hazards
- **Fertility effects**: No known significant effects or critical hazards

**NUMERICAL MEASURE OF TOXICITY**

- **Acute toxicity estimates**: There is no data available.

SECTION 12. ECOLOGICAL INFORMATION

- **Toxicity**: No data available
- **Persistence and degradability**: No data available
- **Bioaccumulative potential**: No data available

**MOBILITY IN SOIL**

- **Soil/water partition coefficient (KOC)**: No data available
- **Other adverse effects**: No known significant effects or critical hazards

SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions, and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.
**SECTION 14. TRANSPORT INFORMATION**

<table>
<thead>
<tr>
<th>DOT</th>
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<th>IATA</th>
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<tr>
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<td>Packing group</td>
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<tr>
<td>Environmental hazards</td>
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<td>No</td>
</tr>
<tr>
<td>Additional information</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Special precautions for user**

Transport within users’ premises: Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**SECTION 15. REGULATORY INFORMATION**

**U.S. Federal regulations**

- **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined
- **United States inventory (TSCA 8b)**: All components are listed or exempted.

- **Clean Air Act Section 112**
  - (b) Hazardous Air Pollutants (HAPs): Not listed

- **Clean Air Act Section 602**
  - Class I Substances: Not listed
  - Class II Substances: Not listed

- **DEA List I Chemicals (Precursor Chemicals)**: Not listed

- **DEA List II Chemicals (Essential Chemicals)**: Not listed

- **SARA 302/304**
  - Composition/information on ingredients: no products were found

- **SARA 304 RQ**
  - Not applicable

- **SARA 311/312**
  - Classification: Not applicable

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>CAS NUMBER</th>
<th>%</th>
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<tbody>
<tr>
<td>Form R - Reporting requirements</td>
<td>Aluminium oxide 1344-28-1</td>
<td>≥ 5 – ≤ 10</td>
</tr>
<tr>
<td>Supplier notification</td>
<td>Aluminium oxide 1344-28-1</td>
<td>≥ 5 – ≤ 10</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET
Boron Carbide

SECTION 15. REGULATORY INFORMATION, CONTINUED

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

STATE REGULATIONS

Massachusetts  The following components are listed: Aluminum oxide
New York       None of the components are listed.
New Jersey     The following components are listed: Aluminum oxide
Pennsylvania   The following components are listed: Aluminum oxide
California Prop. 65  No products were found.

SECTION 16. OTHER INFORMATION

Date of issue mm/dd/yyyy  12/30/2012
Version                2
Prepared by            KMK Regulatory Services Inc.

Notice to reader: To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.