SECTION 1 - IDENTIFICATION

Product Name: PDS Boron Nitride Planar Diffusion Sources
Product Code: BNHT, BN975, BN1100, BN1250, BN1050
MSDS Manufacturer Number: 600
Synonyms: Boron Nitride Solid
Product Use/Restriction: Not intended for food and drug use.
Manufacturer Name: Saint-Gobain Advanced Ceramics Corporation
Address: 168 Creekside Drive
Amherst, NY 14228-2027
General Phone Number: (716) 691-2000
General Fax Number: (716) 691-2090
Emergency Phone Number: 1-800-424-9300 (CHEMTREC)
CHEMTREC: For emergencies in the US, call CHEMTREC: 800-424-9300
Canutec: In Canada, call CANUTEC: (613) 996-6666 (call collect)
Website: www.bn.saint-gobain.com
MSDS Creation Date: July 13, 2009
MSDS Revision Date: June 15, 2015

SECTION 2 - HAZARD(S) IDENTIFICATION

GHS Class: GHS Category 5
Emergency Overview: CAUTION! Exposure to dust may be irritating to eyes, nose and throat.
Route of Exposure: Eyes. Skin. Inhalation. Ingestion.
Potential Health Effects:
Eye: May cause eye irritation.
Skin: May cause skin irritation.
Inhalation: Inhalation of dusts from this product may cause temporary mechanical irritation of the nose, throat and respiratory tract.
Ingestion: This route of entry is unlikely. If ingested, substance is considered non-toxic. If ingested, may cause mouth, throat and gastrointestinal tract irritation and upset with possible nausea, vomiting and diarrhea.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS#</th>
<th>Ingredient Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron nitride</td>
<td>10043-11-5</td>
<td>30-99 %</td>
</tr>
<tr>
<td>Silica, amorphous</td>
<td>7631-86-9</td>
<td>0-65 %</td>
</tr>
<tr>
<td>Boron oxide</td>
<td>1303-86-2</td>
<td>0-10 %</td>
</tr>
</tbody>
</table>

Component: All ingredients listed above may not always be included in a final product. Exact composition of final products will vary with each individual product.

SECTION 4 - FIRST AID MEASURES

Eye Contact: Immediately flush eyes with plenty of water for 15 to 20 minutes. Get medical attention, if irritation or symptoms of overexposure persists.
Skin Contact: Immediately wash skin with plenty of soap and water for 15 to 20 minutes, while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.
### SECTION 5 - FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable Properties</td>
<td>Non Flammable.</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No information.</td>
</tr>
<tr>
<td>Flash Point Method</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Auto Ignition Temperature</td>
<td>No information.</td>
</tr>
<tr>
<td>Lower Flammable/Explosive Limit</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Upper Flammable/Explosive Limit</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.</td>
</tr>
<tr>
<td>Protective Equipment</td>
<td>As in any fire, wear Self-Contained Breathing Apparatus (SCBA), MSHA/NIOSH (approved or equivalent) and full protective gear.</td>
</tr>
<tr>
<td>Hazardous Combustion Byproducts</td>
<td>Decomposition of this product may yield oxides of boron and nitrogen. Decomposition of boron nitride occurs at 2204 °C (4000 °F).</td>
</tr>
</tbody>
</table>

### NFPA Ratings:

- **NFPA Health:** 1
- **NFPA Flammability:** 1
- **NFPA Reactivity:** 0
- **NFPA Other:**

### SECTION 6 - ACCIDENTAL RELEASE MEASURES

<table>
<thead>
<tr>
<th>Precaution</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Precautions</td>
<td>Use proper personal protective equipment as listed in section 8.</td>
</tr>
<tr>
<td>Environmental Precautions</td>
<td>Avoid runoff into storm sewers, ditches, and waterways.</td>
</tr>
<tr>
<td>Methods for containment</td>
<td>Containment of this material should not be necessary.</td>
</tr>
<tr>
<td>Methods for cleanup</td>
<td>Shovel or sweep up for re-use or disposal. Avoid creating dusty conditions. Provide ventilation. Clean up spills immediately observing precautions in the protective equipment section.</td>
</tr>
</tbody>
</table>

### SECTION 7 - HANDLING and STORAGE

| Handling                              | For industrial use only. Handle with care. Avoid dust formation. Do not breathe dust or spray mist. |
| Storage                               | Store in a cool, dry, well ventilated area away from sources of heat and incompatible materials. Keep container tightly closed when not in use. |
| Hygiene Practices                     | Wash thoroughly after handling. |

### SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION - EXPOSURE GUIDELINES

<table>
<thead>
<tr>
<th>Control</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Controls</td>
<td>Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.</td>
</tr>
<tr>
<td>Eye/Face Protection</td>
<td>Safety glasses with side-shields.</td>
</tr>
<tr>
<td>Skin Protection Description</td>
<td>Normal work clothing (long sleeved shirt, long pants, and gloves) is recommended.</td>
</tr>
<tr>
<td>Hand Protection Description</td>
<td>Use impervious gloves.</td>
</tr>
<tr>
<td>Respiratory Protection</td>
<td>If ventilation is not sufficient to effectively prevent buildup of dusts, appropriate NIOSH respiratory protection must be provided. Consult the NIOSH web site <a href="http://www.cdc.gov/niosh/ngo/t%E6%BB%94/topics/respirators/disp_part">here</a> for a list of dust respirator types and approved suppliers.</td>
</tr>
<tr>
<td>Other Protective</td>
<td>Follow good industrial hygiene practices when handling this material.</td>
</tr>
</tbody>
</table>

**EXPOSURE GUIDELINES**

- **Boron oxide**
  - Guideline ACGIH: TLV-TWA: 10 mg/m³
Guideline OSHA: PEL-TWA: 15 mg/m³ Total particulate/dust (T)
Guideline NIOSH: : 2000 mg/m³
British Columbia Canada : OEL-TWA: 10 mg/m³
Quebec Canada : VEMP-TWA: 10 mg/m³

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

Physical State: Solid.
Color: White off-white or gray
Odor: Odorless
Boiling Point: Not determined.
Melting Point: Not determined.
Specific Gravity: 1.8 - 3.0
Solubility: Insoluble in water
Vapor Density: Not applicable.
Vapor Pressure: Not applicable.
Percent Volatile: Not applicable.
Evaporation Rate: Not applicable.
Evaporation Point: Not applicable.
pH: Not determined.
Molecular Weight: Mixture
Viscosity: Not applicable.
Flash Point: No information.
Flash Point Method: Not applicable.
Auto Ignition Temperature: No information.

SECTION 10 - STABILITY and REACTIVITY

Chemical Stability: Stable under normal conditions.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Extreme heat, sparks, and open flame. Incompatible materials, oxidizers and oxidizing conditions.
Incompatible Materials: This product may react with strong acids or oxidizing agents.
Special Decomposition Products: Decomposition of this product may yield oxides of boron and nitrogen. Decomposition of boron nitride occurs at 2204 °C (4000 °F).

SECTION 11 - TOXICOLOGICAL INFORMATION

Boron nitride:
Skin: Administration onto the skin - Rabbit LD₅₀: >20 mL/kg [Details of toxic effects not reported other than lethal dose value]

Silica, amorphous:
Eye: Eye - Rabbit Standard Draize test.: 25 mg/24H

Boron oxide:
Eye: Rabbit Standard Draize test.: 50 mg
Eye: Administration onto the skin - Rabbit Standard Draize test.: 1 gm
Skin: Oral - Rat LD₅₀: 3150 mg/kg [Details of toxic effects not reported other than lethal dose value]
Ingestion: Oral - Mouse LD₅₀: 3163 mg/kg [Details of toxic effects not reported other than lethal dose value]

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicity: No ecotoxicity data was found for the product.
Environmental Fate: No environmental information found for this product.

SECTION 13 - DISPOSAL CONSIDERATIONS
Waste Disposal: Dispose of in accordance with Local, State, Federal and Provincial regulations.

SECTION 14 - TRANSPORT INFORMATION

DOT Shipping Name: Not Regulated.
DOT UN Number: Not Regulated.
IATA: Not Regulated.

SECTION 15 - REGULATORY INFORMATION

Risk Phrases: R36/37/38 - Irritating to eyes, respiratory system and skin.
Safety Phrase: S22 - Do not breathe dust.
S37/39 - Wear suitable gloves and eye/face protection.

Boron nitride:
TSCA Inventory Status: Listed
EINECS Number: 233-136-6
Canada DSL: Listed
South Korea KECL: Listed: KECI Number - KE-03535
Australia AICS: Listed: Assessed by NICNAS: No

Silica, amorphous:
TSCA Inventory Status: Listed
EINECS Number: 231-545-4
Massachusetts: Listed
Pennsylvania: Listed
Canada DSL: Listed
Canada IDL: Identified under the Canadian Hazardous Products Act Ingredient Disclosure List: 0.1%.1403(1488)
South Korea KECL: Listed: KECI Number - KE-31032
Australia AICS: Listed: Assessed by NICNAS: No

Boron oxide:
TSCA Inventory Status: Listed
EINECS Number: 215-125-8
Massachusetts: Listed
Pennsylvania: Listed
Canada DSL: Listed
Canada IDL: Identified under the Canadian Hazardous Products Act Ingredient Disclosure List: 0.1%.205(228)
South Korea KECL: Listed: KECI Number - KE-09919
Australia AICS: Listed: Assessed by NICNAS: No

SECTION 16 - ADDITIONAL INFORMATION

HMIS Health Hazard: 1
HMIS Fire Hazard: 1
HMIS Reactivity: 0
HMIS Personal Protection: X
MSDS Creation Date: July 13, 2009
MSDS Revision Date: June 15, 2015