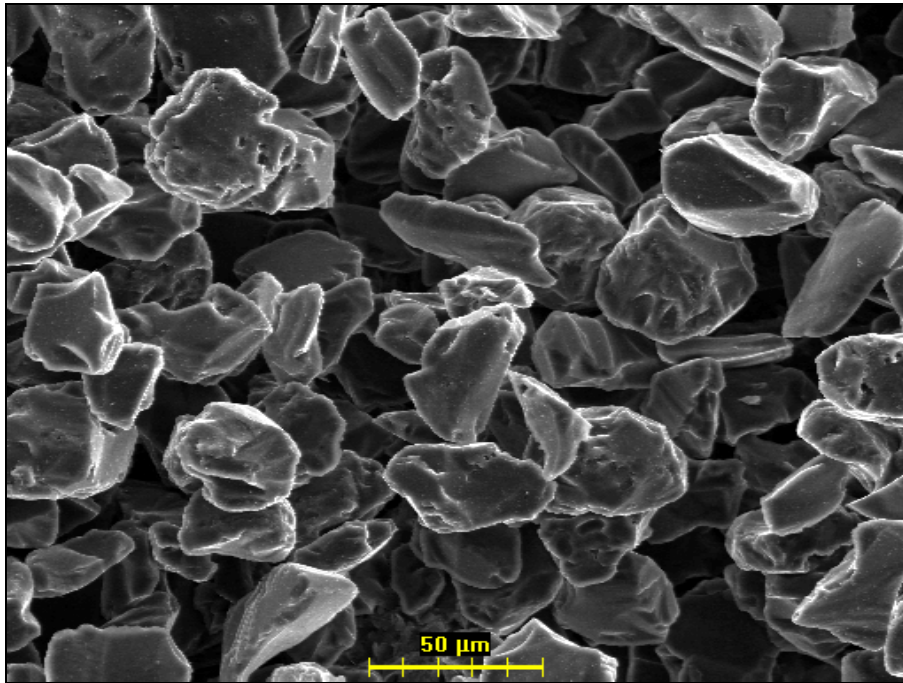


# HA 9305

## BORON CARBIDE

Product Code: 008  
Technical Data Sheet

Revision: # 002  
Dated: 01/01/08



**Figure 1:** Typical Powder Morphology (SEM 500X)

### 1. PHYSICAL PROPERTIES

HAI's Boron Carbide Thermal Spray Powder is used by Customers applying PVD coatings on metals and other materials. Boron Carbide is selected for sputtering most often due to its electrical resistivity and high hardness properties.

<b>Molecular Formula</b>	<b>B<sub>4</sub>C</b>
<b>CAS #</b>	<b>12069-32-8</b>
<b>Melting Point [°C]</b>	<b>2,445</b>
<b>Hardness, (Knoop)</b>	<b>2,900 – 3,580</b>
<b>Crystal Structure</b>	<b>Rhombohedral</b>
<b>Density [g/cm<sup>3</sup>]</b>	<b>2.52</b>

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## 2. CHEMICAL PROPERTIES

### 2.1. Typical Chemical Analysis

<u>Element</u>	<u>Weight Percent</u>
Boron	78 min.
Carbon	21 min.
Aluminum	<0.01
Iron	<0.01
Silicon	<0.03
Oxygen	<0.03

## 3. POWDER MORPHOLOGY AND PARTICLE SIZE DISTRIBUTION

### 3.1. Powder Morphology

- 3.1.1. Powder has an angular shape as produced by the fused and crushed process
- 3.1.2. Typical Powder Morphology using SEM is shown in Figure 1.

### 3.2. Particle Size Distribution

- 3.2.1. The typical powder size range measured with Tyler according to ASTM B214 is -270 mesh +10  $\mu\text{m}$
- 3.2.2. Table 1 shows the required and typical particle size distribution measured with Microtrac according to ASTM B822
- 3.2.3. Figure 2 shows the typical Microtrac particle size distribution graph

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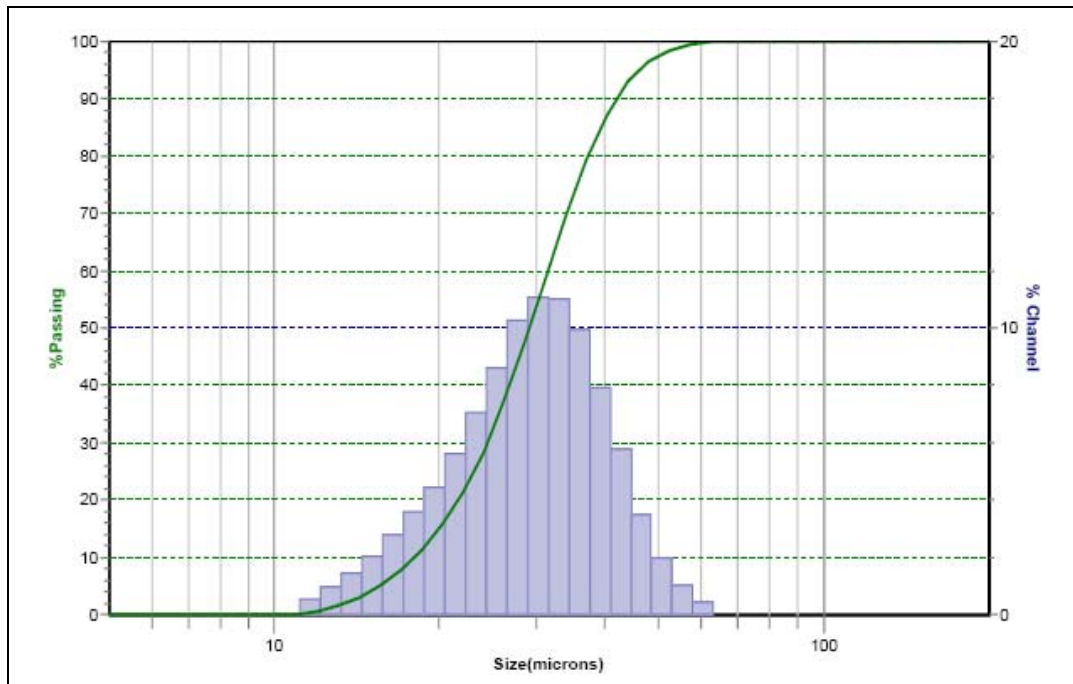
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**Table 1: Typical and Required Microtrac Particle Size Distribution**

<u>Percentile</u>	<u>Typical Particle Size</u>		<u>Mean</u>	<u>Required Particle Size</u>
[%]	[ $\mu\text{m}$ ]			
0.01	11.02		D <sub>10</sub>	12 - 22 $\mu\text{m}$
5.00	15.55			
10.00	17.95			
16.00	20.26		D <sub>50</sub>	25 - 35 $\mu\text{m}$
50.00	29.14			
84.00	38.82			
90.00	41.88		D <sub>90</sub>	40 - 50 $\mu\text{m}$
95.00	45.90			
99.99	62.06			



**Figure 2: Typical Microtrac Particle Size Distribution**