

# Boron Carbide (B4C) - Applications and Properties by Washington Mills

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**Boron Carbide is one of the hardest man-made materials available in commercial quantities that has a finite melting point low enough to permit its relatively easy fabrication into shapes. Some of Boron Carbide's unique properties include: high hardness, chemical inertness, and a high neutron absorbing cross section. Washington Mills is the only manufacturer of Boron Carbide in North America.**

## Description

Boron Carbide is one of the hardest man-made materials available in commercial quantities that has a finite melting point low enough to permit its relatively easy fabrication into shapes.

## Applications of Boron Carbide

Boron Carbide, due to its high hardness, chemical inertness, and high neutron absorption cross section, is well suited to a variety of industrial applications including:

- Wear parts such as blasting nozzles, wire-drawing dies, powdered metal and ceramic forming dies, thread guides, and armor.
- Abrasives for lapping and ultrasonic cutting
- Nuclear applications such as reactor control rods and neutron absorbing shielding
- Anti-oxidant in carbon-bonded refractory mixes

BORON CARBIDE is graded to FEPA specifications

## Typical Chemical Analysis of Boron Carbide

Following table describes the typical chemical analysis of Boron Carbide.

TYPICAL CHEMICAL ANALYSIS	
Chemical	High Purity
Total Boron	Min. 76.5%
Total Carbon	21.5%
Total B + C	Min. 98.0%

Iron

0.2%

## Typical Physical Properties of Boron Carbide

Following table describes the typical physical properties of Boron Carbide.

TYPICAL PHYSICAL PROPERTIES	
Physical Property	Specification
Crystallography	Rhombohedral
Color	Black
Specific Gravity	2.52
Knoop <sub>100</sub> Hardness	2800
Shape	Blocky - Angular
Melting Point	2350° C
Grading	FEPA 42-GB-1984 (R1993)

## Grain Sizes Available

Boron Carbide is available in the following grit sizes from Washington Mills:

6, 8, 10, 12, 14, 16, 20, 24, 30, 36, 46, 54, 60, 70, 80, 90, 100, 120, 150, 180, and 220

## Powder Sizes Available

Washington Mills can supply Boron Carbide in the following powder sizes:

240, 280, 320, 400, 500, 600, 800, and 1000

Also available in group-grades, for specific customer requests.

# WASHINGTON MILLS

This information has been sourced, reviewed and adapted from materials provided by Washington Mills.

For more information on this source, please visit [Washington Mills](#).

Washington Mills

WASHINGTON MILLS

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Washington Mills is a world leader in the manufacture and distribution of abrasive materials and fused mineral products. As the largest producer in North America with sales and manufacturing facilities around the world, our capabilities are unrivaled in the industry. We offer a rich array of abrasive grains and specialty electro-fused minerals. From macro grits to micro grits, to custom specialty fusions, our fused materials are used around the world in hundreds of different industries and applications.

**An Industry Leader**

Washington Mills is leading the way as:

- A technologically advanced microgrit and sub-micron powder producer with a state-of-the-art European microgrit production facility.
- One of the world's largest manufacturers of silicon carbide, operating the only environmentally friendly silicon carbide plant in North America.
- A trusted partner in helping companies develop their new materials through our specialty product development and fusion services
- The largest producer of fused materials in North America

## Products

Some of the products Washington Mills offer include:

Alumina Bubbles	Fused Silica
Alumina Zirconia	Fused Zirconia
Alumina Silica Fines	High Chromium Ruby Colored Fused Aluminum Oxide
Boron Carbide	Oxide
Brown Aluminum Oxide	Iron Pyrite
Ceramic Media	Magnesium Oxide
Chrome Alumina	Potassium Fluoroborate
Custom Fusions	Refractory C-A Toll Fusion
Emery	Silica Fume
Ferro Silicon	Silicon Carbide
Fused Mag-Chrome	Synthetic Cryolite
Fused Mullite	Steel media
Fused Pink Aluminum Oxide	White Fused Alumina
Fused Spinel	Zirconia
	Zirconia Mullite