

Optimized Materials for Critical Applications

Nuclear Power

Advanced Materials

Semiconductor

Specialty Services



Ceradyne Boron Products is the leading global commercial processor of enriched boron and is the largest Boron isotope enrichment facility in the world today. The organization is focused on manufacturing optimized materials with current emphasis on stable boron isotopes. Proprietary processes allow ^{10}B and ^{11}B enrichment from natural occurring ratios up to levels exceeding 99% isotopic purity.

Optimized Materials for Critical Applications

Established in the early 1970s under EaglePicher Boron and since acquired by Ceradyne, Inc., Boron Products is located in Quapaw, Oklahoma where safety, innovation and quality are emphasized. Well known for the ability to engineer products that suit critical applications, specialists solve materials-related problems for nuclear reactors, semiconductor fabrication, neutron detection and environmental technologies.

Materials are produced under an ISO 9001:2008 quality system and comply with 10 CFR 21 and 10 CFR 50, App. B.

The broad range of optimized materials available at Ceradyne Boron Products is made possible through advanced enrichment technology which yields unequaled purity in our product offerings.



Nuclear Power

The nuclear renaissance has led to an unprecedented number of new nuclear power plants being proposed, planned, and under construction. Next Generation reactor systems will require advanced materials for very high temperature applications, for enhanced criticality control, and for safe, efficient and reliable fuel cycle management.



Chemistry

Ceradyne Boron Products continues to research and develop advanced materials in support of the nuclear industry as it transitions to GEN3 and GEN4 reactor designs. Strong technical expertise in advanced ceramic materials and the ability to supply the Boron 10 isotope make Boron Products uniquely positioned to contribute to the nuclear renaissance.

EBA – Enriched Boric Acid

${}^7\text{Li}$ – Lithium 7 Hydroxide Monohydrate

NaP^{10}B – Enriched Sodium Pentaborate

Neutron Absorbers

Ceradyne Boron Products, along with its sister company, Ceradyne Canada, offers a diverse range of extruded and rolled BorAluminum™ Alloy, BORTEC® MMC and BORAL® Composite products for spent nuclear fuel containment. These products provide market-leading performance for neutron absorption in reactor control systems, wet and dry spent nuclear fuel storage, and transport applications.

BORAL®

BORTEC®

BorAluminum™

BoroBond™

Enriched Iron Boride

Enriched Potassium Fluoroborate

Nuclear Fuel Applications

Boron based compounds are used to control the reaction rate. Ceradyne Boron Products' materials limit the introduction of new materials to the reactor environment, thus reducing the number of daughter products created.

Zr^{10}B_2 – Enriched Zirconium Diboride

B_4C – Natural & Enriched Boron Carbide

Advanced Materials

Advanced material solutions are developed for use in homeland security, waste stream management, medical and alternative energy applications. A growing global economy has created a demand for advanced technologies to protect the environment and safeguard resources.



Environmental Technologies

Advanced ceramics are increasingly used to protect the environment, for natural resource conservation, and to contain harmful byproducts. BoroBond shows utility in nuclear containment, personnel safety and waste mitigation as well as providing structural advantages compared to competing products, while TiB_2 reduces carbon dioxide emissions in aluminum manufacturing.

BoroBond™

TiB_2 – Titanium Diboride

Neutron Detection

A high thermal neutron absorption cross-section and excellent gamma discrimination makes Boron 10 ideal for applications in neutron detecting technologies. Ceradyne Boron Products offers a range of ^{10}B enriched materials manufactured to meet customer specific technologies.

$^{10}B_4C$ – Enriched Boron Carbide

^{10}B – Enriched Boron Metal

$^{10}B_2O_3$ – Enriched Boron Oxide

$^{10}BF_3$ – Enriched Boron Trifluoride

Semiconductor

Consumer demand for smaller, faster and more efficient electronic devices continues to drive the semiconductor industry to develop better manufacturing technologies and materials to meet this demand. Advanced technologies for fabricating P-type semiconductor materials (doped with Boron) require innovative solutions to meet stringent technical requirements. Ceradyne Boron Products is enabling the technological advancements by providing high purity boron materials to the semiconductor industry.

$^{11}\text{BF}_3$ – Enriched Boron Trifluoride

K^{11}BF_4 – Enriched Potassium Fluoroborate

UHP B – Ultra High Purity Boron Powders



Specialty Services

As a manufacturer of specialty, high purity chemical and isotopic products, Ceradyne Boron Products maintains sophisticated analytical and testing capabilities at the manufacturing facility in Quapaw, Oklahoma. Onsite analytical laboratories primarily support production activities and assure that products meet or exceed specifications.

Ceradyne Boron Products owns and operates two large vacuum hot presses designed to manufacture highly dense ceramic materials. These presses are capable of extremely high temperatures and pressures while maintaining the protection of a vacuum or inert gas atmosphere. Using customer owned starting materials, Ceradyne Boron Products' toll pressing services provide final shapes and value-added product characteristics.

Analytical Services

Toll Pressing



3250 S 614 Road
Quapaw, OK 74363
918-673-2201
918-673-1052 fax
inquiry@ceradyneboron.com
www.ceradyneboron.com

