

3M Advanced Materials Division

3M™ 10B Enriched Iron Boride

Introduction

3M™ 10B Enriched Iron Boride is produced by 3M Technical Ceramics Inc., as an additive used in the manufacture of borated steel and borated stainless steel. Our high quality material is designed to be added to molten metals following purification activities. In addition to the standard product described below, 3M Technical Ceramics has the flexibility to customize products. We can create variations in terms of isotopic content, boron content, particle size, and in some instances impurities.

Typical Physical Properties

(Not for specification purposes)

Characteristic	Typical Range
Boron Enrichment	> 95.0 wt% ¹⁰ B
Boron Content	17-19 wt%
Impurities:	1.0 wt% max.
Carbon	< 0.2 wt%
Aluminum	< 0.5 wt%
Silicon	< 0.5 wt%
Manganese	< 0.7 wt%

Boron Enrichment Capabilities

3M Technical Ceramics is a leading global commercial processor of enriched boron, and is one of the largest boron isotope enrichment facilities in the world today. We focus on manufacturing optimized

materials with an emphasis on stable boron isotopes. Our proprietary manufacturing processes allow ¹⁰B and ¹¹B enrichment from natural occurring ratios up to levels exceeding 99% isotopic purity. We offer secure supply, consistent product quality and the ability to custom engineer products for your unique applications. Our specialists are experts at solving materials-related problems in the demanding nuclear and semiconductor industries. For more information, contact us at boron@mmm.com.

Analytical Services

As a manufacturer of specialty, high purity chemical and isotopic products, 3M Technical Ceramics maintains sophisticated analytical and testing capabilities at its manufacturing facility in Quapaw, OK. Our analytical laboratories support on-site production activities and provide our customers with data and evidence that the products they receive meet or exceed their requirements. Our laboratories are fully equipped with current-generation instruments to perform a full range of testing procedures, including: inductively coupled plasma mass spectrometry; atomic absorption spectroscopy; ion and gas chromatography; carbon/sulfur and oxygen/nitrogen analysis; particle size analysis and BET surface area measurement.

Toll Pressing

3M Technical Ceramics owns and operates two of the largest vacuum hot presses in the United States. Designed to press powdered ceramic materials into highly dense shapes, these presses are capable of extremely high temperatures and pressures while maintaining the protection of a vacuum or inert gas atmosphere.

3M Technical Ceramics' toll pressing services utilize customer owned or provided starting material to achieve final shapes and product characteristics. At these extreme conditions, only simple shapes such as blocks, cubes, plates and cylinders are possible. We have extensive experience pressing boron carbide, boron nitride, silicon carbide, titanium and zirconium diborides, aluminum nitride and several customer proprietary materials. The capabilities of these presses are as follows:

Pressing Force	400 and 700 tons
Temperatures	To 2200°C
Vacuum	To 40 microns
Die Size	34 in. diameter, 60 inches tall
Typical Die Material	Carbon/graphite

Packaging

Fiber drum or poly bottle. Certified analysis furnished with every shipment. Product is available in small billets of approximately 750 grams or in discrete particle size as desired by the customer. Specific enrichments, purities, and particle sizes are available to meet special requirements.

Product Storage, Handling and Safety

Storage: Store away from heat. See product Safety Data Sheet (SDS) for additional information.

Handling: Avoid eye contact. Avoid skin contact. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. See product SDS for additional information.

Safety: Handling of this product may be hazardous. See product SDS for additional information.

Regulatory Summary

One or more components in this material are approved for specific commercial use under a U.S. EPA Low Volume Exemption.

Approved commercial use:

1. An ingredient alloy for borated stainless steel production.

Refer to SDS for additional information.

Product is manufactured and sold by 3M Technical Ceramics Inc.

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