

3M Advanced Materials Division

# 3M™ 10B Enriched Boron Trifluoride



## Introduction

Ceradyne, Inc., a 3M company, manufactures 3M™ 10B Enriched Boron Trifluoride, used in the manufacture of neutron detectors.

## Typical Physical Properties

(Not for specification purposes)

Isotopic Enrichment*	3M™ 10B Enriched Boron Trifluoride
<sup>10</sup> B (atomic %)	>99.0%
Chemical Purity**	
BF <sub>3</sub>	>99.9%
Properties	
Molecular Weight	67.0
Vapor Density (air - 1)	2.38
Boiling Point	-148°F (-100°C)
Melting Point	-196.6°F (-127°C)
Flash Point	non-flammable

\* The boron-10 ratio is determined by inductively coupled plasma mass spectrometry (ICP-MS).

\*\* Determined by GC-DID and FTIR.

## Boron Enrichment Capabilities

Ceradyne 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 <sup>10</sup>B and <sup>11</sup>B enrichment from natural occurring ratios up to Introduction 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](mailto:boron@mmm.com).

## Analytical Services

As a manufacturer of specialty, high purity chemical and isotopic products, Ceradyne maintains sophisticated analytical and testing capabilities at its manufacturing facility in Quapaw, OK. Our analytical laboratories support on-site production activities and assure our customers 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.

## Standard Cylinder Properties

(Not for specification purposes)

Cylinder	O.D. Inch (mm)	Length Inch (mm)	Gross Weight Lbs. (kg)	Wall Inch (mm)	Volume Cubic Inch (Liters)	Service Pressure (psi)	Test Pressure (psi)	Fitting (NGT)	Max. Fill <sup>10</sup> BF <sub>3</sub> (grams)
0.44L	1.94 (49.28)	11.88 (302)	2.3 (1.04)	0.095 (2.41)	25.5 (0.418)	1800	3000	3/4	150
2.13L	4.15 (105)	13.5 (343)	11.0 (4.98)	0.100 (2.54)	130 (2.13)	2015	3360	3/4	600
8.4L	7.00 (178)	17.40 (442)	25.0 (11.3)	0.160 (4.06)	525 (8.60)	2015	3360	3/4	1600

## Packaging

All cylinders are fully D.O.T. certified containers manufactured from carbon steel. Customer cylinders may be filled upon request. Cylinders sold separately.

Valves are 316 stainless steel CGA 330 or DISS 642. Non standard valves and cylinders may require additional delivery time.

**Minimum Order:** 50 Grams

## Product Storage, Handling and Safety

**Storage:** Keep container tightly closed to prevent contamination with water or air. If contamination is suspected, do not reseal container. Protect from sunlight. Store in a well-ventilated place. Store away from heat. See product Safety Data Sheet (SDS) for additional information.

**Handling:** Do not use in a confined area with minimal air exchange. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Wash contaminated clothing before reuse. See product Safety Data Sheet (SDS) for additional information.

**Safety:** Handling of this material may be hazardous. Do not breathe dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Wear protective gloves, protective clothing, and eye/face protection. Wash thoroughly after handling. See product Safety Data Sheet (SDS) for additional information.

## Regulatory Summary

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

1. Used in manufacture of Neutron Detectors

See SDS for additional information.

**Product is manufactured and sold by Ceradyne, Inc., a 3M company.**

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