The VAC BF$_3$ sources provide significantly improved safety over traditional high pressure sources by dispensing gas at only sub-atmospheric pressure. VAC sources utilize Swagelok’s innovative HF series set pressure regulator (SPR) which is internally mounted to control cylinder output pressure to sub-atmospheric levels, virtually eliminates the possibility of experiencing a hazardous or toxic gas leak.

A significant benefit achieved with the VAC package is extended cylinder lifetime which reduces the risks associated with cylinder changeouts. Designed to operate on existing high pressure gas sticks, no special low pressure flow controllers are required. Sealing integrity at the cylinder connection is maintained with a UHIS (Ultra high integrity service) metal gasket fitting.

**APPLICATIONS**
- Ion implantation “P” type dopant
- Isotopically enriched BF$_3$ source

**ADVANTAGES**
- Sub-atmospheric delivery
- Minimized release potential
- Easily adapted for use on high pressure gas sticks
- Large deliverable
- Long cylinder lifetime

**PHYSICAL PROPERTIES**
- Chemical Formula: BF$_3$
- Molecular Weight: 67.81
- Flammability Limits: none
- Specific Gravity: 2.37 @ 21°C ($\text{air} = 1$)
- Specific Volume: 6.25cf/lb ($0.37M^3/kg$)
- Toxicity:
  - TLV/PEL: 1 ppm
  - LC 50: 387 ppm
  - IDLH: 100 ppm
- Corrosivity: High
- Odor: Pungent
PERFORMANCE SPECIFICATIONS

- Cylinder Delivery Pressure: 500 Torr
- Cylinder Storage Pressure: 1250 psig
- Cylinder Valve: Tied Diaphragm 316L Stainless Steel
- Outlet Connection: UHIS SA-B (pin indexed)
- Shelf Life: 3 years

PURITY ANALYSIS

- Isotopically Enriched: ≥ 99.7 Boron¹¹
- Boron Trifluoride (BF₃): ≥ 99.9% min.

CONTAMINANT Specifications

- Argon (Ar): ≤ 25 ppm
- Carbon Dioxide (CO₂): ≤ 25 ppm
- Hydrogen Fluoride (HF): ≤ 25 ppm
- Nitrogen (N₂): ≤ 25 ppm
- Oxygen (O₂): ≤ 25 ppm
- Sulfur Dioxide (SO₂): ≤ 25 ppm

HANDLING

- D.O.T. Description: Boron Trifluoride
- Hazard Class: 2.3, UN1008
- Poison– Inhalation Hazard, Zone B
- D.O.T. Shipping Labels: Poison Gas
- D.O.T. Guide Number: 15
- CAS Number: 7637-07-2

<table>
<thead>
<tr>
<th>Cylinder Size</th>
<th>Cylinder Dimensions</th>
<th>Deliverable Capacity</th>
<th>Shipping Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 L</td>
<td>4” D x 17.3” H</td>
<td>1000g (357 L)</td>
<td>11.5 kg (25 lbs)</td>
</tr>
</tbody>
</table>