High-Capacity UpTime®
Sub-Atmospheric Delivery System
A safe, cost-effective dopant gas delivery system for ion implanters

Increase productivity with the UpTime® delivery system - OEM qualified and production proven

The UpTime® sub-atmospheric dopant gas delivery system is designed as an alternative to existing adsorbent-based technology used in ion implanters. Compared to the existing technology, the UpTime system offers industry leading product capacity, higher product purity and a lower cost of ownership.

The UpTime system is comprised of an internal vacuum actuated valve in series with a specially designed internal flow restrictor. The UpTime device is designed for safety, with two different types of safeguards: a mechanical actuator and a flow restrictor.

UpTime Product Family
- Enriched 72Germanium Tetrafluoride
- Germanium Tetrafluoride
- Silicon Tetrafluoride
- Arsine
- Phosphine
- Isotopically Enriched 11Boron Trifluoride.*

Features
- Sub-atmospheric delivery
- Internal flow restrictor limits flow to 20 sccm
- SEMI® S2 and S8 compliant
- Highest equivalent-cylinder product capacity
- High product utilization
- Robust safety features
- Ultra-high purity gas

US Patent Numbers: 5,937,895; 6,007,609
*Additional ultra-high purity gases are available upon request
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Enabling next-generation technology
Praxair specializes in developing high performance and cost-effective products to serve next-generation semiconductor manufacturing.

About Praxair
Praxair is dedicated to helping semiconductor manufacturers lower costs, improve productivity, enhance technology and reduce environmental impact by serving as a single, integrated source for a variety of process gases, materials, and related equipment and services.

Praxair’s commitment to materials science and gas technology includes:

Process Consumables
• Ultra-high purity semiconductor process gases
• Sputtering targets
• ALD/CVD precursors

Fab Infrastructure and Services
• Bulk and on-site gas production
• Analytical systems and services
• Process gas delivery systems
• Total gas and chemical management services
• Integrated supply chain management services

Isotopically Enriched "Boron Trifluoride ("BF₃) Specification, 3.0 grade
• Fill pressure 1250 psig
• Internal flow restrictor limits flow to 438 sccm

Component       Value (ppm)
Boron-11 Isotopic Enrichment >99.7%
Argon + Oxygen    50
Carbon Dioxide    25
Hydrogen Fluoride 25
Nitrogen          25
Sulfur Dioxide    25

Shelf life: 36 months

Gas Stick Recommendations
• 1/4” FVCR cylinder connection
• Vacuum required at cylinder connection between 100 and 610 torr
• Low pressure transducer (ideally 0-1000 torr range)
• Vacuum pressure mass flow controller
• Normally closed pneumatic isolation valve suitable for ≥1250 psig service that automatically closes if pressure exceeds working pressure of low-pressure components
• All components not protected by an isolation valve are suitable for ≥1250 psig service

Gas Box Recommendations
• Toxic gas monitoring of the gas box exhaust
• Gas box exhaust interlocked and abated

Cylinder Specification

<table>
<thead>
<tr>
<th>Cylinder Size</th>
<th>Overall Height</th>
<th>Height to Connection</th>
<th>Cylinder Body Height</th>
<th>Diameter</th>
<th>Content Fill Weight</th>
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