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

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

Arsine (AsH₃) Specification 5.7 grade
• Liquid vapor pressure 205 psig
• Internal flow restrictor limits flow to 20 sccm

<table>
<thead>
<tr>
<th>Component</th>
<th>Value (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argon &amp; Oxygen</td>
<td>0.5</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>0.05</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>0.05</td>
</tr>
<tr>
<td>C₂-C₅ Hydrocarbons</td>
<td>0.05</td>
</tr>
<tr>
<td>Methane</td>
<td>0.05</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>1</td>
</tr>
<tr>
<td>Phosphine</td>
<td>1</td>
</tr>
<tr>
<td>Water</td>
<td>1</td>
</tr>
</tbody>
</table>

Shelf life: 60 months

Gas Stick Recommendations
• 1/2” 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 ≥205 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 ≥205 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 A</th>
<th>Height to Connection B</th>
<th>Cylinder Body Height C</th>
<th>Diameter D</th>
<th>Content Fill Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT-SSELB</td>
<td>16.7” 423mm</td>
<td>13.9” 354mm</td>
<td>11.9” 301mm</td>
<td>2.0” 51mm</td>
<td>195g</td>
</tr>
<tr>
<td>UT-4</td>
<td>18.0” 457mm</td>
<td>15.3” 389mm</td>
<td>13.25” 366mm</td>
<td>4.2” 106mm</td>
<td>600g</td>
</tr>
<tr>
<td>UT-4</td>
<td>18.0” 457mm</td>
<td>15.3” 389mm</td>
<td>13.25” 366mm</td>
<td>4.2” 106mm</td>
<td>1200g</td>
</tr>
<tr>
<td>UT-6</td>
<td>22.5” 571mm</td>
<td>19.73” 500mm</td>
<td>17.5” 445mm</td>
<td>6.25” 159mm</td>
<td>3600g</td>
</tr>
</tbody>
</table>