

THE MAKING OF AN APPLIED SOLUTION:

# SEMI-GAS<sup>®</sup> Xturion<sup>™</sup> Adaptable Source System

When a leading Tier 1 semiconductor company came to AES looking for a gas delivery system to support its process tool research and development efforts, they knew they needed the production-ready quality of our premier SEMI-GAS<sup>®</sup> brand, but with unique flexibility to support ongoing, ever-changing tool experimentation.

**Understanding that system adaptability was the critical requirement, AES set out to engineer a custom Applied Solution to accommodate the customer's diverse application demands.**

## CUSTOMER CHALLENGE

The semiconductor company was seeking a simplified way to deliver different gases—including hazardous, nonhazardous, compressed, and liquefied gases—at different delivery flow rates depending on the specific process tool experiment being run. To date their only solution had been to buy and implement a number of different systems to handle specific gases at specific flow rates, adding costs and hindering flexibility, which is critical to R&D environments.

## THE SOLUTION

Building from our standard SEMI-GAS<sup>®</sup> one cylinder source system, AES custom-engineered the Xturion<sup>™</sup> Adaptable Source System with four separate, self-contained one cylinder enclosures to enable flexible delivery of a wide range of gases within one single solution.

## APPLIED SOLUTION QUICK FACTS

- > **Product Brand Customized:** SEMI-GAS<sup>®</sup>
- > **Industry Served:** Semiconductor
- > **Application Focus:** Process Tool Experimentation
- > **Key Requirement(s):** Adaptability to Support Diverse R&D Demands; Safety
- > **Gases Delivered:** Hazardous, Nonhazardous, Compressed, Liquefied
- > **System Configuration:** Process/Process /Purge/Bubbler System in (4) Separate, Self-Contained Enclosures



## Key Construction Features

Built in a process / process / purge / bubbler system configuration, both process enclosures included 8" exhaust stacks and additional air louvers to accommodate higher exhaust flow scenarios and comply with the Compressed Gas Association (CGA) G-13 code for use with silane and silane mixtures. The separate purge cabinet included an independent purge manifold and purifier for removing gas impurities, such as moisture and oxygen, and high and low pressure supply valves were also added for testing cylinder connections during cylinder changes. The separate bubbler chamber included a regulated bubbler manifold, liquid level sensors, a liquid spill containment pan, and cylinder scales and shelves for safe delivery and monitoring of liquefied gases in vapor phase.

The Xturion™ Adaptable Source System conformed to SEMI S2 standards and was constructed of materials compatible with the widest range of gases, including stainless steel fluid components, Hastelloy® trim regulators, Kalrez® check valves, and PCTFE valve and regulator seats. A multi-zone controlled heating system, with manifold heat trace and variously sized cylinder heating blankets, was integrated to maintain desired flow rates and pressures. To ensure fit-up of a wide range of cylinder types, an adaptable cylinder connection kit, with a 24-piece DISS/CGA connection set and interchangeable pigtails, was also included.

## THE RESULT

The Xturion™ Adaptable Source System has given researchers the gas delivery flexibility they need to innovate faster and more efficiently. The solution offers the same level of premier quality long-associated with AES' SEMI-GAS® brand in the semiconductor space, but with added adaptability to continually, safely evolve with the company's process tool R&D demands—eliminating the need for multiple costly source systems usually required to support such diverse application needs.

## Let AES Apply Innovation to Your Gas Delivery Challenge

Your process requirements are like no other, and your gas handling system should be too. AES' Applied Solutions bring together our robust product offerings, industry-leading services and vertical expertise to solve even the most complex gas delivery and distribution challenges—to benefit customers of all sectors and sizes who have highly specific application requirements. Through Applied Solutions, you can **tap into the innovation necessary to solve your specific gas delivery challenges.**

Tell us about your equipment needs today. Call **610.647.8744** or email [appliedsolutions@appliedenergysystems.com](mailto:appliedsolutions@appliedenergysystems.com).

## Key Safety Features

AES knew the system would require ongoing modifications to accommodate process changes and experiment objectives, and that the ability to safely update the solution was of critical importance. Multiple safety mechanisms were installed to allow such updates to be made securely on site by qualified and experienced operators.

These mechanisms included an integrated Class I Division II PLC Controller with Z-Purge for installation in hazardous locations, featuring an intuitive 12" color operator touchscreen. UV/IR flame detectors were added to the process cabinets for additional safety monitoring, and the system was also equipped for Ethernet communications to enable local and remote system monitoring and data collection.

