Semiconductor Microelectronics
Innovative solutions for improved performance and profitability
If you want to stay on top of advanced processes that require greater, more precise gas and fluid delivery, evolving materials, and the technology innovations that will drive the industry forward, you need to partner with...

PARKER
VERIFLO:

As a technical expert in gas and liquid delivery systems and processes for wafer processing, we can help you profit from today’s developments – while preparing for tomorrow’s challenges. From ALD and ALE to CMP and wafer cleaning, our new ultra high purity stainless steel and fluoropolymer fittings, valves, regulators and manifolds will help you improve cost of ownership, increase productivity and enhance performance.

Emerging Market Trends ¹, ², ³

- Semiconductor technology advances are driving wafers to sizes below 10 nm
- Process windows are shrinking, making the ability to filter, regulate, control and convey gases and aggressive process chemicals increasingly critical
- Innovations in smart mobility, cloud computing, social networking and “big data” analytics are leading to new and more specialized semiconductor requirements
- Industry consolidation is demanding better supply chain management to reduce costs

Customized solutions

Parker has the ability to integrate multiple technologies into unique, customer-focused solutions for both gas and chemical systems that offer improved module reliability in smaller, more cost-effective packages, such as this fluoropolymer manifold solution. Contact Parker Veriflo at (510) 235-1355 to find out more or email us at: veriflo.sales@parker.com.

¹ Global Semiconductor Industry Study by Ernst & Young
² Trends and Opportunities in Semiconductor Licensing, skyworksinc.com
³ Key Trends at SemiconWest 2013, semimd.com/blog
Why Parker in today’s facility

From bulk chemical and gas delivery to wafer cleaning, specialty gas, and tool hookup to OEM equipment, Veriflo products deliver.

- Proven ultra high purity gas and liquid delivery devices and assemblies
- More stainless steel and fluoropolymer fittings, valves, regulators and manifolds than any other supplier
- Integrated solutions that work together seamlessly to increase throughput, ensure media purity and reduce expensive downtime
- Selectable levels of integration to reduce technical risk
- Joint product development services from concept through production, including application and validation support as needed

National and international certifications verify that our systems and solutions offer the highest possible quality and reliability.

PROVEN. SAFE. RELIABLE. RESPONSIVE.
We have been the primary supplier of ultra high pressure (UHP) regulators and valves for leading semiconductor tool manufacturers for over 25 years.

SIMPSONIFIED SUPPLY CHAIN
As a single source provider, Parker saves you time and money with an unmatched fluoropolymer and stainless steel alloy selection.
- Industry-leading pricing
- Fast turnaround times
- Supply chain management

FREE TECHNICAL SUPPORT AND TRAINING
We offer worldwide technical support and on-site technical training at no cost to you. Regional technical support is also available, with backup support from USA senior application engineers.

GLOBAL CONNECTIVITY AND LOCAL AVAILABILITY
Our global footprint assures local availability, no matter where you develop, assemble, manufacture or operate.
The new **gas and liquid delivery** products needed for tomorrow’s wafer manufacturing.

**Ultra High Purity, Competitively Priced FR Series Regulators**

**Applications:** Valve manifold boxes, point-of-use tool hookup and gas cabinets

Parker’s FR 1000 and FR 1400 Series of ultra high purity regulators provide precise, stable control of process gases in downstream point-of-use applications, reducing short- and long-term costs for semiconductor OEMs, integrators, and fab facilities. Both offer metal-to-metal seals for enhanced leak integrity; Hastelloy® C-22® diaphragms for increased cycle life and corrosion resistance; single-melt or double-melt 316L stainless steel construction.

- FR 1000 Series – Low flow capacity with 0.09 Cv and 0.15 Cv versions; sealed cap and bonnet port standard on double-melt 316L stainless steel models
- FR 1400 Series – Tied diaphragm design with 0.5 Cv high flow capacity; low inlet pressure (300 psig) and high inlet pressure (3000 psig) models available

**New Corrosion Resistant Series P22 Valves Reduce Tool Cost**

**Applications:** Wet etch and wafer cleaning

New ultra clean manual and pneumatic valves offer increased flow and provide better seat sealing for enhanced leak-free performance and greater safety.

- Deliver high cycle life in acids and slurries with reduced maintenance
- True lock-out, tag-out design on manual valves
- Compact footprint
- Meet SEMI F57-0301 standards

**CFM1 Series Compact Ultrasonic Flow Meter**

**Applications:** Liquid delivery, wafer cleaning, slurry

Offers greatly increased accuracy (plus or minus 2% of reading)

- Provides a higher turndown ratio. Handles higher concentration acids, slurries, and other typical semiconductor process fluids
- Six-channel converter reduces space

**INNOVATIONS IN ACTION**

With the world’s appetite for electronics and mobile devices continuing to grow, our newest solutions will help you meet the challenges they create.

**Cost-Saving UHP Metal Face Seal and Weld Fittings**

**Applications:** Valve manifold boxes, gas cabinets and tool hookups

Specifically designed for ultra high purity (UHP) semiconductor applications. Compact design allows for system miniaturization and close coupled spacing. Permanent heat code marking on wetted components provides full material traceability. All new products are available in SEMI F20 compliant material.

- UHP Metal Face Seal fittings available as glands, nuts, caps and plugs in 316, 316L and 316L double-melt stainless steel; pressures up to 8000 psig
- UHP Weld fittings available in 316L and 316L double-melt stainless steel in elbows, tees, crosses and reducers; pressures up to 8500 psig

**HPX1 Series High Purity PFA Heat Exchanger for High Resolution Process Temperature Control**

**Application:** Wafer cleaning

Special PFA tubing enables high performance temperature control of chemicals. Transfers heat to surrounding fluids while ensuring process purity and safety through a leak-proof design.
Our top-to-bottom performance and productivity solutions*

**BULK GAS:**
Bulk Gas Distribution

**GAS CABINETS**

**BULK CHEMICALS:**
BCDS

**VMBs/CMBs**

*Typical three-level fab facility configuration*
REGULATORS


NPR4000 Series: UHP single stage. For applications involving negative delivery pressures with low pressure gas sources such as WF6, BCL3.


QR4000 Series: High purity, high pressure non-tied diaphragm regulator with metal-to-metal seal.


SQ Servo: Ultra precision, high flow regulator. Incorporates pressure-setting knob controlling a precise pressure sensor, pneumatic servovalve and a high flow, “dome loaded” large SQ pressure regulator controlled by the servovalve.


VALVES


F9 Series: UHP check valves. Stainless steel. Welded. Features a patented, asymmetric spring design for consistently quiet operation. Sized to conserve panel space.

Quantum 830: Value-priced for diaphragm valve high purity applications. Similar to 930 Series.


600 Series: CvMax UHP stainless steel bellows valves. Manual and pneumatic. The industry’s leading straight-through full flow for the highest gas flow with minimal pressure drop.

700 Series: UHP stainless steel bulk gas distribution valves. High flow bellows. Unique design reduces valve weight, lowering installation costs.

845 Series: UHP stainless steel diaphragm valves. High pressure. Welded. 845AOP offers patent-pending actuator requiring only 75 psi actuation pressure. Operates from vacuum to 3,500 psig.

855 Series: UHP stainless steel diaphragm valves. High flow. Welded. Similar to, but lower priced than the 955. 250 psig max for manual and air actuated versions.


935 Series: 1/2" UHP stainless steel positive retraction diaphragm valves. High flow. Superior control of gases and liquids.


FITTINGS


MiniButtweld: Leak-free fittings for ultra high purity applications. Compact for use with orbital weld equipment. Prevent outgassing and inhibit corrosion.

VacuSeal™: Leak-free for UHP applications. Mating gasket and toroid design provide a metal-to-metal seal from vacuum to positive pressure.

OTHERS

VAC100 Series: UHP vacuum generator. Stainless steel. Welded. For use in conjunction with purge systems.

Click on specific product names for additional information.
REGULATORS

**PR-01 Pressure Regulator:** 1/4” regulator from modified PTFE with precision machined seat offers high cycle life, lower replacement costs and less downtime.

**PR-08 Pressure Regulator:** 1/2” regulator with no exposed metals for use in high purity fluid handling applications, including aggressive chemicals and slurry. Large diaphragm prevents the effects of pressure surge transfer downstream.

**BR-08 Back Pressure Regulator:** Improved performance with no exposed metals. For aggressive chemical and slurry applications. Prevents the effects of pressure surges from transferring downstream. One piece, precision machined diaphragm manufactured from modified PTFE.

VALVES


**MV-10 PFA Manual 2-Way Diaphragm Valves:** Full 1/4" orifice provides maximum flow in a compact package. Molded PFA body with precision machined sealing areas for superior chemical resistance.

**MV-11 PFA Manual 2-Way Diaphragm Valves:** Full 1/2" orifice provides maximum flow in a compact package. Molded PFA body with precision machined sealing areas for superior chemical resistance. Submersible option.

**MV-12 PFA Manual 2-Way Diaphragm Valves:** Full 1" orifice provides maximum flow in a compact package. Molded PFA body with precision machined sealing areas for superior chemical resistance. Requires three full turns from fully closed to fully open position.

**MV-13 Series Needle Valves:** One-piece PFA stem/handle and bodies provides strength and corrosion resistance for aggressive chemical and gas applications. PFA stem stop for safer operation.


**MV-20-04 PFA Manual 2-Way Diaphragm Valves:** PTFE slurry valve. Molded PFA body with precision machined sealing areas for superior chemical resistance. Improved cycle life with less fluid shear. High load point seat seal.

**MV-10 PFA Manual 2-Way Diaphragm Valves:**

**CV-1 Check Valves (1/4" – 1"):** High purity PTFE valves for aggressive chemical or gas applications. No O-rings required for sealing. Machined PTFE spring for low cracking pressure and minimal back pressure for resealing.

**CV-32 Check Valves (2"):** The largest fluoropolymer check valve in the industry for bulk chemical transfer. High integrity sealing for back flow protection for PFA piping systems. Low cracking pressure. High flows.

**RV Series Relief Valves:** Molded PFA body with precision machined PTFE seats and diaphragm poppet. Permits flow upon reaching field set relief pressure. Resets when 35% of set point is reached.

**MV-13 Series Needle Valves:**

**Full Line PFA/PTFE Thermoplastic Valves:** Includes full listing of manual and pneumatic valves, as well as check, relief and solenoid valves.
FITTINGS

**Parbond:** For ultra pure or corrosive chemical applications. Leak-tight connections ideal for high flow, minimal pressure drop applications. Requires fusion welding.

**Parflare:** For ultra pure or corrosive chemical applications. PFA body for cleaner operation. Leak-tight with minimal dead volume. Can be used in side loading and vibration applications.

**Pargrip:** For corrosive environments and chemical applications. Leak-tight connections reduce downtime. Easy assembly. Numerous configurations reduce system complexity and cost.

MANIFOLDS

**CASys (Custom Manifold Assemblies):** Offer typical space savings of 70% while eliminating many connections, minimizing dead legs and reducing installation costs and labor.

FLOW METERS

**CFM1 Compact Ultrasonic Flow Meter:** Offers greatly increased accuracy (plus or minus 2% of reading) compared to competition. Handles higher concentration acids, slurries and plating chemicals. Six channel converter saves space.

HEAT EXCHANGERS

**HPX1 Heat Exchanger:** Transfers heat to surrounding fluids while ensuring process purity and safety through a leak-proof design. Completely submersible.

OTHER

**PFA Gauge Protectors:** Suitable for pressure, vacuum, and dual range operations in semiconductor and aggressive chemical applications. In-line design for quick installation. Available with or without a gauge.

**SMU-1 Series Inline Static Mixers:** Improved radial mixing efficiency and consistency for quick and convenient mixing of chemicals, CMP slurry and deionized water. Smaller footprints than competition.

**PPV Series 6” PFA Pressure Vessels:** For use in dispensing chemical delivery systems utilizing vacuum/pressurization techniques. Modular design with standard components for easy customization.

**PFA DI Water Spray Gun:** High purity PFA body with precision machined sealing areas. No need for elastomer seals. Optional recirculation kit. Available with multiple connectors.