

Company Profile

Celerity is a technology leader providing critical instruments and systems integration solutions in advanced gas and chemical delivery to the global semiconductor and electronics industries. Our customer base includes both original equipment manufacturers (OEMs) and fab owners.

With vertically integrated solutions and global resources, Celerity is uniquely positioned to provide the most compelling set of products and services with respect to quality, flexibility, cycle time, cost of ownership, and accelerated time to market.

Celerity's technology solutions sult from a strong engineering core competency in fluid dynamics, thermal heat transfer, physical chemistry, advanced electronics, and software engineering. This expertise is accentuated in technologies that require high-precision mechanical engineering and thermal and magnetic modeling, such as MultiFlo™, Step™ and PTI found in our gas delivery modules and liquid flow control, concentration management, and particle characterization technologies used in chemical delivery modules.

Celerity maintains ISO 9001 certified clean room manufacturing facilities globally and an experienced team of application and service engineers to provide 24/7 customer support. Through a firm commitment to continuous improvement, Celerity has received a number of quality awards and is recognized by key customers for outstanding quality performance and business processes.

Principal Industries Served

- > Semiconductor
- > Flat panel display
- > Magnetic and optical storage solar devices
- > Micro-electro Mechanical System (MEMS)

Celerity Solution

Integrated Delivery Module and Flow Control Solutions

In the semiconductor industry, as well as other industries, semiconductor original equipment manufacturers (OEMs) are increasingly outsourcing the design and manufacturing of key elements of their products to value added suppliers. This shift to outsourcing is primarily taking place due to OEMs sharpened focus on their core competencies and allocation of their resources to their primary manufacturing processes.

Celerity is a preferred module and flow control technology supplier to many leading OEMs. Our end-to-end offering includes a comprehensive set of services supporting each step of a product life cycle. By partnering with our customers as a seamless extension of their RD&E, manufacturing, and service

Celerity Fast Facts

Founded: 1999
Employees: 1,000
Corporate Headquarters: San Jose, CA

Global Resources

Customer support: 14 offices worldwide providing direct sales, service and applications support.

- Global technical support
- Gas and liquid delivery module manufacturing
- Gas and liquid flow control manufacturing
- Chemical and slurry blending and distribution equipment manufacturing
- Gas pressure measurement and display manufacturing
- Vacuum measurement and control manufacturing

Manufacturing & Service Locations

United States	International	
Allen, TX	Bangalore, India	Seoul, South Korea
Austin, TX	Dublin, Ireland	Shanghai, China
Irvine, CA	Dresden, Germany	Singapore
Portland, OR	Hsinchu, Taiwan	Tianjin, China
	Selangor, Malaysia	Tokyo, Japan

Management Team

Timothy Harris, *Chief Executive Officer*
David Somo, *Senior Vice President of Sales and Marketing*
David J. Shimon, *Board Advisor*
Mark Hutson, *Senior Vice President – Integration Division*
Richard Wissenbach, *Senior Vice President and General Manager – Instruments Division*
Ron Lacey, *Vice President of Finance*

organizations, we reduce cost, improve product life cycle management, and accelerate time to market.

It's the Technology that Makes the Difference

Celerity's innovative technologies result from strong multidisciplinary core competency in fluid dynamics, thermal heat transfer, physical chemistry, and advanced electronics and software engineering. At Celerity, we work closely with our customers throughout the entire development process to ensure that our products meet the toughest process requirements in the industry.

Gas Process Module Technology



MultiFlo™

MultiFlo Technology

MultiFlo is a revolutionary technology used in all our digital mass flow controllers (MFCs). MultiFlo enables users to reconfigure an MFC to a gas and range of choice, anywhere, anytime using a bundled software package. MFCs with MultiFlo come in nine standard configurations, covering 85% of the gases and ranges used in a typical production fab. The unique customer benefits that MultiFlo provides include increased tool uptime, dramatic reduction in inventory requirements, increased flexibility, and lowered cost of ownership.



Step™

Step Technology

Step is a technology used in Celerity mass flow controllers which enables fast response in critical process applications. Step utilizes a high speed DSP (digital signal processor) and employs an optimized sensor drive circuit to deliver industry leading flow stabilization time. This results in improved wafer throughput time for low flow semiconductor/flat panel display applications and enables fast-switching processes, such as the Bosch process employed in MEMS manufacturing.



PTI

PTI Technology

Flow changes in gas delivery systems commonly cause pressure surges resulting in flow instability of up to 100%. Pressure surges, which are difficult to diagnose, often create process inconsistencies, tool downtime, and unnecessary replacement of perfectly good components. Celerity's next generation gas modules with embedded PTI (Pressure Transient Insensitive) technology maintains flawless flow control and output stability, even during pressure surges.

Liquid Process Module Technology

Particle Characterization Technology

Particle Characterization assesses particle size and distribution in slurries and other process chemistries, ensuring the integrity of chemical mechanical polishing, or CMP, processes. By tracking particle size and distribution in slurries, the technology can identify any excursion in size or population, and give process operators the opportunity to react to the presence of contaminant particles. Moreover, we can make our particle characterization technology available for both bulk slurries and at the polishing station's point-of-use.

Flow Control Technology

Flow Control measures and controls the flow of liquids to a new level, in which fab owners can tailor the process or delivery method to reduce chemical consumption. The technology is even capable of accommodating dynamic changes in manufacturing recipes. Customers realize significant savings through more efficient use of chemicals - both in bulk delivery and at the tool - which facilitates process optimization previously not possible.

Concentration Management Technology

Concentration Management measures the concentration of constituents in blended chemistries, ensuring the repeatability and precision of the manufacturing process. This results from our pioneering methods that guarantee correct assays, both in batch mode and point-of-use. Our ability to supply chemical blend systems provides customers significant return on

investments and helps lower cost of ownership. Our concentration management technology delivers a valuable flexibility, as manufacturers adjust to next-generation materials and device sizes.

Design and Engineering

We offer complete system design services – from specifications to engineering and final design. Throughout the process, we align ourselves with our customers' engineering procedures, establishing virtual design collaboration with their CAD files and bills of materials. Leveraging the latest IT technologies, our engineers and customers work together concurrently at every stage of the design process.

Our team of research scientists, product development personnel, manufacturing specialists, and hardware and software engineers are all focused on making advancements in flow control and fluid delivery technology. We have close relationships with OEMs and end users, which provide us with a broad understanding of their needs and technology requirements. Our customers recognize us as experts capable of assisting them in the design of their gas and chemical delivery requirements and the selection of module components for their new wafer processing equipment.

Global Manufacturing

In order to meet our customers' strict requirements for quality and time to delivery, we have established global manufacturing operations that enable us to provide process modules on a just-in-time basis, in most cases without regard to order size or change in specifications. All of our manufacturing processes are based on a quality business system that starts in the sales cycle and continues through customer service and support. We operate clean room manufacturing facilities in the United States in Texas, California, and Oregon; and internationally in Ireland, South Korea, and Japan. At all sites worldwide, we leverage a shared knowledge in safety, functional standards, and environmental regulations and provisions. We design for compliance and obtain certification to meet international industry standards, including Semi S2, Semi F-15, CE, UL, UFC, NFPA, and NEC.

Life Cycle Support Solutions

Today's advanced process technologies and manufacturing operations require proven performance of gas and chemical delivery systems. Celerity provides technical support from the process design phase throughout the life of the equipment. We begin by assisting OEM's and device manufacturers in selecting the best solution up-front and provide comprehensive support throughout the life of the equipment. This includes final integration and test at the OEMs facility, installation, startup through production at the end users site, and process development all the way through process upgrades and retrofits.



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