

TRION TECHNOLOGY

Company Profile

Overview

Trion Technology, Inc. is the largest domestic US supplier of custom Plasma Etch and Deposition Equipment for over 20 years. We also have a significant presence in Asia with equipment in Japan, China, Taiwan, Philippines, Malaysia and Singapore.

Trion manufactures a wide variety of systems for the Compound Semiconductor, MEMS, Opto-Electronic and other markets. Our products feature the smallest footprint and lowest cost systems in the industry with proven production reliability. If you wish anything from full-blown production cluster tools to a simple laboratory system, Trion makes it.

Mission Statement

To provide the semiconductor industry with state-of-the-art processing equipment at a reasonable cost.

Benefits

- Innovative, state-of-the-art design
- Simple modular designs
- Reasonably priced
- Advanced process support laboratories
- Reliable equipment backed by a fast, responsive service team

Customers

Trion's customers include almost all the major semiconductor firms, many US government agencies as well as the majority of US universities.

We have affiliate sales and service offices for the United States, Canada, China, Israel, Korea, Malaysia, Philippines, Russia, Singapore, Taiwan, Thailand and Vietnam.



Trion's Founder, Randy Crockett

Mr. Addison (Randy) Crockett has over 25 years semiconductor equipment design experience. Prior to founding Trion Technology, Mr. Crockett served as R&D and Applications Manager for Tegal Corporation and was a Co-Founder of Matrix Integrated Systems serving as Vice President R&D and Engineering. Mr. Crockett has personally designed eleven systems for plasma-based processes including four systems for high volume front-end production.



Trion Florida – Manufacturing

10,000 sq. ft. facility
Sales headquarters
Equipment engineering and reliability lab
Computer programming lab
Machine assembly line
Clean room for final assembly and test
Service office
Parts depot

2131 Sunnysdale Blvd., Clearwater, FL 33765
(727) 461-1888 • fax (727) 461-1858
www.triontech.com • info@triontech.com



Trion Florida – On Site Machine Shop

12,000 sq. ft. facility
Automated machine shop
- Water cutter
- 3 CNC lathes
- 3 CNC vertical mills
- 1 Dual table horizontal mill
- Stir weld capability
Manual machine shop for quick turn R&D
- 2 CNC manual vertical mills
- 3 Manual lathes
Anodizing line



Trion Arizona – Corporate & Research

16,000 sq. ft. facility
3000 sq. ft. clean room
- R&D lab
- Advanced sample lab
Parts depot

1025 South 52nd Street, Tempe, AZ 85281
(480) 968-8818 • fax (480) 968-8896
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Company Milestones

- 2022 750th machine delivered.
- 2013 550th machine delivered.
Trion announced a strategic alliance with European distributor.
- 2008 Trion opened Taiwanese Service Office.
Trion sold further four Titan production platforms to a world leader in High Brightness LED Marketplace
- 2007 400th machine delivered.
Trion expanded sales and services offices in Taiwan and Russia.
At SEMICON West 2007, Trion introduced the Titan: a new vacuum loadlocked plasma system for semiconductor production.
Trion landed multiple orders from Advanced Chip Engineering Technology, Inc. (ACET)
At SEMICON Europa 2007, Trion introduced the Gemini: a new multi-chamber photoresist stripper.
- 2006 350th machine delivered.
Trion set up a service office for Malaysia, Singapore, Thailand and Philippines
At SEMICON West 2006, Trion introduced the Apollo: an affordable photoresist stripper.
University of Massachusetts received \$700K grant to establish Nano-Imprint Lithography Lab (Trion Phantom RIE).
Full article at www.nanotechnology.com.
- 2005 A competitively-priced multi-chamber Stripper is developed and released.
A DRIE system for MEMS applications is released.
- 2004 300th machine delivered.
- 2002 Trion set up a 12,000 sq. ft. machine shop in Clearwater, enabling faster production and more competitive pricing.
- 2001 200th machine delivered.
Trion completed a 4,000 sq. ft. expansion of the Tempe Research Facility.
All manufacturing operations moved to a 10,000 sq. ft. building in Clearwater.
- 2000 150th machine delivered.
Trion purchased and moved into new, larger facilities in Tempe.
Trion set up a fully-equipped lab for demo and process development in Tempe.
The first fully-automated systems for high volume production began delivery.
- 1999 100th machine delivered.
Trion introduced the Apollo, an ICP Stripper designed to address the complex issues associated with feature sizes below 0.5 microns on ICs. It removes organic and inorganic materials eliminating the need for post-strip wet chemical processes.
- 1998 Trion introduced the Oracle, a flexible, low-cost turnkey cluster tool capable of supporting independent process reaction chambers for etch, deposition and sputtering of chlorinated or fluorinated chemistries.
- 1997 Trion expanded into a new facility in Tempe.
- 1996 50th machine delivered.
Trion expanded sales and services offices in Europe and Asia.
- 1995 Trion began manufacture and service of the Orion PECVD system and Phantom RIE tool to semiconductor research and development companies, universities and foundries.
- 1994 25th machine delivered.
Trion relocated to Tempe, Arizona.
Trion began a joint development project with SEMATECH on liquid source silicon nitride, elimination of silane for safety concerns.
- 1993 Trion began manufacturing and service of the Minilock-Phantom, a loadlocked RIE tool, to semiconductor research and development companies, universities and foundries.
- 1990 Trion delivered their first machine to AMD.
- 1989 Addison (Randy) Crockett established Trion Technology, Inc. in Austin, Texas.

Product Testimonials

"Frankly, the Phantom has been a GREAT machine since I have been a user. For this machine that has been at least 10 years. This Phantom was purchased originally by Philips where I used to work. The Phantom has followed me to Sipex and now Exar. I can't imagine living without it. It has been one of the best made and reliable plasma etchers I have used in my over 20-year career." – Don Breedlove, Failure Analysis Engineer, Exar Corporation

"I've found both machines [Orion PECVD and Phantom RIE] to be quite robust, indestructible by comparison to some other lab equipment." – Lee M. Fischer, National Institute for Nanotechnology, University of Alberta

"This will be my fourth acquisition of a Reactive Ion Etch tool with Trion Technology. I just want you to know that this affirms our confidence in your products. My experience with Trion Technology since 1991 has always been positive. Every Trion tool that I have had the pleasure of acquiring from you has performed satisfactorily with unsurpassed reliability. I would like for you to know that your service department has also been very helpful to our staff when it comes to service and maintenance issues. These performance factors will always keep us as a Trion customer." – P.N.

"The Trion [Phantom] unit is exceptional. We are thoroughly delighted with it, and it remains the workhorse and centerpiece of all our work. Indeed, should the need arise this year; we would immediately turn to Trion for our etcher needs." – T.G.

"I can say without a doubt that the Trion [Minilock-Phantom RIE] ICP system has become a workhorse for many research groups in the ECE and Material Sciences Departments. The equipment has helped produce state-of-the-art compound semiconductor devices. These devices include high bandgap GaN transistors, high-speed quantum well modulators, InP nanowire transistors and photodetectors, photonic crystal devices, and surface plasmon enhanced solar cells, to name a few. The equipment will soon be transferred to a new facility to serve users from all parts of California and all over the country." – Y.L.

"We have no immediate need at this time for any new equipment but if we do in the future, I would strongly consider Trion as a potential source if the type of machine we require is manufactured by Trion." – J.H.


"I really like the machine ... and the downtime has been low." – F.M.

Service Testimonials

"Thank you for the prompt response and the information. I find it so refreshing when I encounter a company such as Trion that will take the time to give suggestions as to where to go for an item when they can't provide it." - Robert (Bob) Brebber, Specialist Technician – NanoFab, University of Alberta

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" Again I want to once again dearly thank you for your kind help throughout this whole issue. Your after sales service team and yourself are truly brilliant and I would always recommend your company in the future." - Arash Hajjam, Licensed PE (Colorado) PhD Candidate, Electrical Engineering, M.Sc, Bio-Electrical Engineering, Dept of ECE, University of Denver www.engr.du.edu/nemslab/arash.html

AMD  "We just wanted to drop a quick note, to thank Trion. Recently John visited with us to install and upgrade our Trion RIE tool. John was extremely knowledgeable and professional, he knew exactly what to do, and completed the services in a timely manner. It was a pleasure working with John. Thank you for your great support!" - Shannon Smith, AMD

"Thank you for the excellent service and the prompt turnaround. It is greatly appreciated. If every one of our tool suppliers operated like Trion my life would be a lot easier." - Robert (Bob) Brebber, Specialist Technician – NanoFab, University of Alberta

"Continuing to do courtesy service on our older, out-of-warranty machines has really sold me on excellent customer service."

"Super job! Very knowledgeable. He fixed several additional issues with the tool he spotted. He also looked at an additional tool in the CFA Lab. Thanks a million."

"Thanks for having a crack at etching our InP-based material and we will keep your suggestions in mind. We have had some great success getting the Trion systems online and we are using them extensively in our InP-based VCSEL product development. You'll also be pleased to know that the ICP/RIE system you assisted me with at Trion is working like a charm." – E.S.

"I really have to thank you for such a timely response on our service call. Your technician was great, we really needed our machine up and running by this morning so yesterday he worked at our lab until midnight and made it happen! Really nice of him, and thanks again!" – L.O.

"Thanks! I have really enjoyed working with Trion. This was my first experience evaluating, purchasing and installing a piece of equipment for this company, and the customer service and general responsiveness from Trion made everything possible." – M.K.

"I have been very pleased with the continued support with respect of answering emails, returning phone calls, and timely on site visits."

"They did a fantastic job addressing the various system problems that we faced - the efforts were appreciated. Quick response by Trion to the various software and hardware issues allowed us to successfully meet a critical DOE deadline for lab readiness."

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