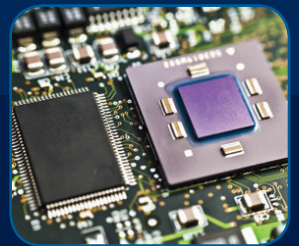
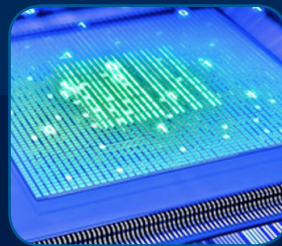
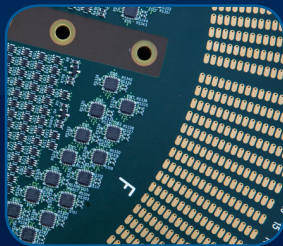
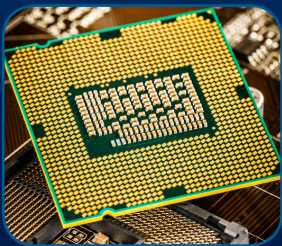




Streamline Electronics Manufacturing, Inc.

# World Class Electronics Manufacturing Services



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# Introduction

Streamline Electronics Manufacturing, Inc. (SEM) is a contract manufacturer specializing in the area of electronics related assembly. Located in the heart of Silicon Valley, California, SEM supports a diverse customer base throughout the United States. For over twenty years, SEM has remained a respected resource for a host of electronics assembly needs.

SEM is an ESD-protected, full service, electronics manufacturing house, offering a variety of consignment and turnkey solutions in areas such as: PCB layout & design, product design, PCB assembly (SMT and through hole), cable harness assembly, flying probe, in-circuit and functional testing, prototype and production runs, and full systems integration.

SEM's mission is to be the recognized leader in quality and service when manufacturing electronics products for our customers. SEM welcomes the opportunity to demonstrate how our capabilities can translate into guaranteed satisfaction and potential success for your company. If you are interested in a price quote, would like to meet with us, or have any questions, please contact us. We are confident that once you choose SEM, you will be here to stay.

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# Company Background

Streamline Electronics Manufacturing, Inc. (SEM), has been a trusted contract manufacturer in Silicon Valley for over twenty years. Through the years SEM has continued to grow as a company, expanding into larger and better facilities, offering more advanced services, and constantly upgrading our tools and equipment. SEM has made a commitment to provide superior services and high quality workmanship to our customers. We invest in the latest technologies, train and cross-train our employees, and have adopted a policy of continuous enhancements. Numerous customers have trusted SEM over the years due to our dedication to excellence.



SEM has proved to be a stable and long term provider of CM services by staying strong after the 2001 and 2009 market crashes. SEM has done this by making a commitment to excellence through strategic decision making, strong management and a diverse customer base. SEM's broad customer base includes respected names from ATE, Aviation, Medical, Semiconductor, Industrial Controls and Telecom industries, amongst others.

SEM obtained its ISO 9002 registration in 1997, a documented pledge to a quality assurance system. As part of our commitment to continuous improvement, SEM upgraded its quality system to ISO 9001:2008 in 2008 and to the latest standard of ISO 9001:2015 in 2018. SEM added the full service RoHS compliance capability in 2006.

We have continued to develop and enhance our capabilities to process highly complex ATE products that require fast turnaround and extreme care. SEM has invested extensively in equipment and in process development in order to offer world class services in processing load boards/ test boards for ATE industry. Currently, the SEM Fremont facility is one of the best facilities in the world to process complex NPI for ATE and any other industry. Recent and upcoming events at SEM continue to pave the road for further improvement, development, and expansion.

## Facility

SEM has a 30,000 square foot ESD safe, RoHS compliant facility in Fremont, California. We have an educated, experienced and dedicated team of managers, engineers, technicians and operators. SEM maintains a quality operation streamlined for efficient production and superior service.



# Capabilities

## Valor by Mentor Graphics

SEM has constantly evaluated tools to enhance its ability for early detection of manufacturing issues, a key factor in successful NPI launch. Valor by Mentor Graphics is the top of the line tool for design for manufacturing (DFM) and design for test (DFT) analysis. Valor gives us the ability to evaluate and detect discrepancies in manufacturing and testing processes ahead of the actual run; this is an essential capability in a quick turn NPI environment.

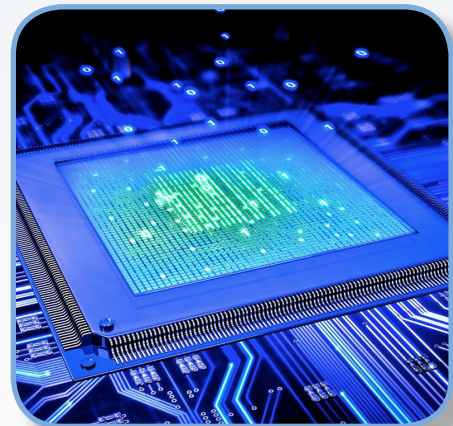
The use of Valor allows us to control all manufacturing activities from a single source of data generation. A single command and control system gives us the ability to reliably control changes in a dynamic NPI environment.

## NPI and Quick Turnaround

SEM has extensive experience in designing and manufacturing products for a variety of industries. Our manufacturing facility is fully capable and qualified to serve every industry with any level of engagement that our customer desires. SEM excels in providing services for complex assemblies in a NPI environment by using DFX, refinement/ validation of critical processes, documentation, methods of detection, traceability and constant monitoring. SEM offers multiple quick turn options ranging from 24 hours to 72 hours turnaround time, depending on the customer needs.

## Process Control and Quality Management Systems

SEM has put in place a robust quality management and process evaluation program that ensures excellent results the first time and every time. The ISO compliance for producing Medical products has helped SEM strengthen its capabilities in addressing the stringent design, engineering and manufacturing requirements needed for its medical, as well as, non-medical customers.



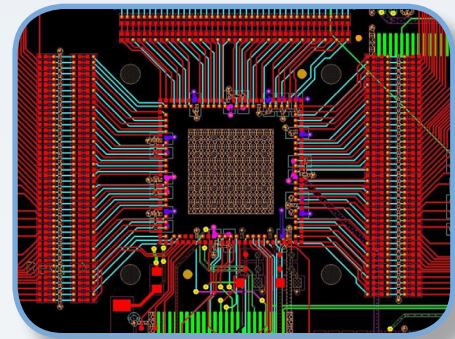
## RoHS Compliance Services

SEM has the capabilities to offer full service RoHS compliance. In order to manufacture per the RoHS requirements, we have added the necessary capabilities from component procurements, material storage, SMT, wave soldering all the way through Final QC. This commitment to compliance required the addition of capital equipment, training of personnel and the full dedication from the management team, which we have accomplished!



## PCB Layout and Design

From conception of design to finished product, SEM offers a one-stop solution for all of your electronics manufacturing needs. SEM has a full design and layout center equipped with the latest software versions of layout and schematic capture tools. SEM has a team of highly qualified PCB designers who can design and layout your new PCB assemblies. SEM works closely with its customers to ensure that the finished product is exactly what you want and need.



## Material Handling Solutions

At SEM our customers enjoy true freedom for their material handling solutions. We work with the model that best fits your needs.

We offer the following material handling solutions

- ◆ Consigned material
- ◆ Semi-turnkey material
- ◆ Full turnkey material



## Vapor Phase Soldering Process

SEM continuously evaluates and invests in new processes. SEM has evaluated the Vapor Phase (VP) soldering process and concluded that it is a gentler way of processing lead-free or assemblies that require higher temperature processing. The VP process is also beneficial in maintaining a certain maximum temperature throughout the product where high mass PCB or components are soldered along with lower mass components; VP process helps prevent uneven heating. SEM has invested in the VP soldering process as part of enhancing RoHS and heavy PCB processing requirements.

## Production Support

SEM has a 30,000 square feet, Class 1 ESD safe, RoHS and ISO 13485 compliant facility, we are capable of producing high quality prototypes to production runs under one roof. SEM is committed to developing a strong partnership with every customer. We can support the project from the initial concept and design stages, all of the way through the growth into full production levels. SEM has a dedicated and experienced team of managers and engineers that work together to utilize their decades of experience to support quick prototype runs and extensive productions runs. Our team is able to develop and implement a customized process for manufacturing based on each customer and project requirement. Our facility has state of the art equipment capable of component placement from 01005 to large BGA and PCB size from the smallest up to 27" X 30".

We offer the following production support:

- ◆ Prototype runs
- ◆ Pre-production runs
- ◆ Production runs

## Functional, In-Circuit, Flying Probe Test, 5Dx X-Ray

A key service that adds considerable value to the contract manufacturing of Printed Circuit Assembly (PCA) is the ability to deliver fully tested/ verified products, ready to be integrated into the next phase of the product supply chain. By undertaking most of the required testing and inspection during the manufacturing process, improvements are accelerated, quality is enhanced and time-to-market is reduced. Whether the product is a fully configured telecom network or a sophisticated audio mixing unit, the appropriate level of testing will depend on the product's specifications and individual customer requirements. SEM has invested in advanced state of the art equipment and qualified personnel to seamlessly manage all of the testing needs.

SEM has invested in AOI and 3D AOI systems to enhance its inspection capabilities. By optical inspection of the solder paste through the SPI machine to placing AOI at critical checkpoints, consistent quality and yields are produced in ramp up, ramp down or day-to-day processes.

The range of post assembly test services offered at SEM includes the following:

- ◆ Test system Development
- ◆ Functional Testing
- ◆ In-Circuit Testing
- ◆ Single/ Double Sided Flying Probe Testing
- ◆ Burn-In
- ◆ Thermal Cycling
- ◆ 5Dx And 2Dx X-Ray Systems
- ◆ 3D Automatic Optical Inspection (AOI)

SEM has invested in AOI systems to enhance its inspection capability. By optical inspection of the solder paste through the SPI machine to placing AOI at critical checkpoints, consistent quality and yields are produced in ramp up, ramp down or day-to-day processes.

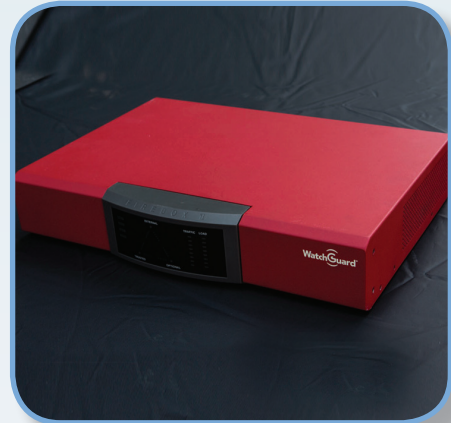
## Systems Integration

SEM's approach to full systems integration is a comprehensive process, which involves designing the assembly, purchasing all of the parts, populating the PCB, and building the entire system. We proceed to perform the required testing, troubleshooting, and burning-in of the system. As an extended service, SEM will even ship the product to your end user. Allowing SEM to complete the entire process can potentially be the most effortless and convenient solution for your system production needs.

## BGA Inspection and Rework

SEM offers in-house X Ray inspection and BGA rework. Agilent Technology's 5DX 5000 Series X Ray Inspection System is a state of the art machine capable of many different analysis and reports. Photon Dynamics SX2000 is an easy setup X Ray machine where shorts can be detected quickly and easily. APR 5000 XLS and DRS20 are fully capable rework stations for any type of remove and replace function of any component; BGA, TAB, Flip Chip, QFP, etc.

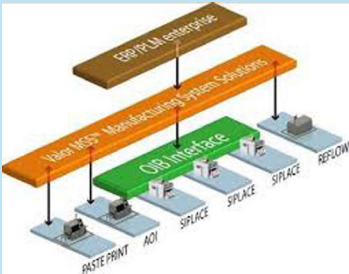
With these pieces of equipment, SEM is fully geared to tackle any manufacturing task arising from new packaging types.





# Tools and Equipment

## Valor by Mentor Graphics For DFM/ DFT/ NPI/ Manufacturing Control



Valor By Mentor Graphics

- ◆ Design For Manufacturing (DFM)
- ◆ Design For Test (DFT)
- ◆ Single point of control, it controls all manufacturing activities from a single source of data generation
- ◆ Rapid time to market, it allows more efficient processing
- ◆ Reduce Waste, it detects errors in manufacturing or test processes before the actual build
- ◆ On-time every time
- ◆ Process conformance
- ◆ Traceability for quality
- ◆ Action through visibility

## Surface Mount Placement Systems



Fuji AIMEX II

- ◆ PCB size, minimum: 1.89" x 1.89" maximum: 30" x 27"
- ◆ A new function enables vision processing data adjustment to be made quickly
- ◆ Handles a wide range of parts from small chips to large parts
- ◆ Capable of placing 180 different components
- ◆ Fully Vision Controlled Chip Shooter; recognizes fiducial marks and bad marks
- ◆ Capable of placing 01005 type packaging



Fuji XPF-W

- ◆ PCB size, maximum: 20" x 27"
- ◆ Fully Vision Controlled Chip Shooter
- ◆ Capable of placing 01005 type packaging
- ◆ Revolver Auto-tool 0.145 seconds/ component- 24,800 components/ hour (cph)
- ◆ Single Nozzle 0.418 sec/ comp- 8,600 cph
- ◆ M4 Auto-tool, 4 nozzles type 0.351 sec/ shot- 10,250 cph 2 nozzles type; 0.462 sec/ shot 7,800 cph
- ◆ Placing accuracy, small chip parts +/-0.050 mm cpk≥1.00 +/-0.066 mm cpk≥1.33
- ◆ Placing accuracy, QFP parts +/-0.040 mm cpk≥1.00 +/-0.053 mm cpk≥1.33
- ◆ Capable of placing 160 different components



Fuji CP642

- ◆ PCB size, minimum: 1" x 1" maximum: 14" x 16"
- ◆ Fully Vision Controlled Chip Shooter
- ◆ Capable of placing 0201 type packaging
- ◆ Capable of placing 160 different components
- ◆ Capable of placing 36,000 components/ hour
- ◆ CAD ready for programming ease



Fuji IP III

- ◆ PCB size, minimum: 2" x 2" maximum: 18" x 18"
- ◆ Fully vision controlled to place fine pitch devices
- ◆ Capable of placing BGA and Micro BGA
- ◆ Capable of placing 30 different QFP's
- ◆ Capable of placing 97 different components
- ◆ Capable of placing 15mil fine pitch devices with accuracy
- ◆ Capable of placing packages from 0402 to 2" x 2" PLCC
- ◆ Capable of placing 6000 components/ hour
- ◆ Accepts parts from tape, tube and tray
- ◆ CAD ready for programming ease

## Surface Mount Glue Dispensing System



Fuji GL 541E

- ◆ PCB size, minimum: 2" x 3" maximum: 14" x 18"
- ◆ Three Dispense Heads
- ◆ Travel distance, X-axis within .31" and Y-axis within .24", needle up/down distance of .31"
- ◆ Material: Epoxy glass, composites, paper phenol, ceramics, polyimide, etc.
- ◆ Height of pre mounted device, top surface: Max .24"
- ◆ Height of pre mounted device, bottom surface: 1"

## Surface Mount Solder Paste Inspection (SPI) System



Cyber Optic Solder  
Paste Inspection

- ◆ Utilizes industry-standard Gerber data input for off-line programming
- ◆ Creates precise descriptions of the pads and components to be inspected from data representing the board
- ◆ Groups pads automatically into components and associates reference designators with these components
- ◆ Improves and simplifies data preparation by using CAD X-Y data or bill of material files
- ◆ Provides Gerber input and data manipulation that many high level CM systems lack

## Surface Mount Automatic Screen Printers with SPI Capabilities



Ekra E-5 Screen Printer

- ◆ PCB size, minimum: 3" x 2" maximum: 21.6" x 21.6"
- ◆ 2 ½ D Inspection
- ◆ Auto Stencil Wiper
- ◆ EVA™ Vision system
- ◆ Magnetic Pins & Plates
- ◆ PCB thickness: 0.02" - .24"
- ◆ PCB transport height: 32.6" – 37.4"
- ◆ Stencil size 12.6" x 12.6" up to 33.4" x 39.3"
- ◆ Frame thickness 1" – 1.5", adjustable without adapter single



MPM AP-36  
Screen Printer

- ◆ Capable of printing PCB size 24" X 24"
- ◆ SEM uses universal frame where foil sheets can be used
- ◆ Fully vision controlled for print accuracy
- ◆ Post print AOI included
- ◆ Fully Automatic Operation with Pass Through Conveyor
- ◆ Automatic Stencil Wipe and Paste Dispenser

## Reflow Vapor Phase System



IBL 609  
Vapor Phase

- ◆ PCB size, maximum 25" X 22"
- ◆ No overheating of components
- ◆ Inert (oxygen free) atmosphere
- ◆ Best wetting of solder
- ◆ Highest solder quality results
- ◆ Low quantity to production volume capable
- ◆ Environmentally friendly
- ◆ Cost sensitive
- ◆ Highest precision and process quality with patented Soft Vapor TemperatureControl (SVTC)

## Reflow Convection Reflow Systems



Conceptronics  
Convection Reflow  
System Model HVC155

- ◆ Meshed belt for PCB size, maximum: 24" x any size
- ◆ Force convection reflow oven with 20 computer controlled heat zones for RoHS compliance
- ◆ Capable of producing and printing a thermal profile
- ◆ Capable of data backlog every 15 seconds



Conceptronics Convection  
Reflow System Model  
VHA102

- ◆ Meshed belt for PCB size, maximum: 24 in. x any size
- ◆ Force convections reflow oven with 14 computer controlled heat zones for RoHS compliance
- ◆ Capable of producing and printing thermal profile
- ◆ Capable of data backlog every 15 seconds



# Test

## Flying Probe Test Systems



Acculogic FLS850D  
Scorpion Flying Probe

- ◆ Double-sided probe with 10 top and 4 bottom probes
- ◆ Capable of testing power on or off
- ◆ C-Scan, Chip Scan and Boundary Scan capable
- ◆ Quick and easy test program generation from CAD data
- ◆ Precision analog test
- ◆ Power-off patented Open Pin Detection on ICs, connectors, and other devices
- ◆ Boundary Scan (JTAG) test
- ◆ Mixed signal function test
- ◆ On-board device programming
- ◆ Advanced multi-camera (up-to 8) dual sided optical inspection
- ◆ Advanced fault coverage report generator
- ◆ Statistical Process Control (SPC)
- ◆ Barcode reader and Board marking system
- ◆ Test large boards and backplanes



Acculogic Sprint  
Flying Probe Tester

- ◆ Single-sided probe upgraded to Acculogic Sprint
- ◆ Quick, simple and economical test platform
- ◆ 4 identical flying probes with 6° probing angle
- ◆ Quick and easy test program generation from CAD data
- ◆ Precision analog test
- ◆ Power-off Open Pin Detection on ICs, connectors, and other devices
- ◆ Mixed signal function test using external instruments
- ◆ On-board device programming
- ◆ Automated Optical Inspection (AOI)
- ◆ Advanced fault coverage report generator
- ◆ Statistical Process Control (SPC)
- ◆ Panelized board test
- ◆ Fixed stationary probes
- ◆ Advanced fiducial recognition system
- ◆ Barcode reader and board marking system

# X-Ray Inspection

## 5DX and 2DX X-Ray



Agilent Technologies  
5DX Series 5000

- ◆ Panel size, minimum: 4" x 5" maximum: 18" x 24"
- ◆ Maximum inspection area: 17.5" x 23.5"
- ◆ Algorithm that tests SMT, through-hole and press fit components.
- ◆ Digital cross-sectional X-ray images of solder joints using mechanical laminography
- ◆ Defects detected: short, misalignment, missing component, non-wetting, billboard, void (BGA, paste), open, insufficient solder, lifted lead, tombstone



Photon Dynamics  
SX2000 X-Ray System

- ◆ PCB size, maximum: 30" X 30"
- ◆ State of the art x-ray system
- ◆ Capable of a variety of analysis and reports
- ◆ Rotary arm gives flexibility in inspection

# Automatic Optical Inspection (AOI)

## 3D and 2D AOI



Nordson Yestech FX-940

- ◆ Yestech Automated In-line 3D AOI System PCB Inspection
- ◆ 5 axis 3D NYT Vision Technology
- ◆ Advanced 3D and 2D inspection
- ◆ 1 top-down and 4 side viewing cameras
- ◆ Quick set up and high defect coverage / low false failure
- ◆ PC data collection & reporting
- ◆ Solder defects and lead defects / lifted leads
- ◆ Component presence
- ◆ Correct component / polarity
- ◆ Co-planarity of chips, BGAs and other height sensitive devices, low false failure rate



Yestech FX Series AOI

- ◆ PCB size, maximum: 22" X 27"
- ◆ 5 megapixel color imaging
- ◆ 1 top-down & 4 side angle cameras
- ◆ Quick set-up
- ◆ High speed
- ◆ High defect coverage
- ◆ Low false failure rate



ASC AV-871 AOI SYSTEM

- ◆ PCB size, minimum: 2" x 2" to PCB size, maximum: 22" x 26"
- ◆ Topside Clearance: 25mm (1 in.)
- ◆ Minimum Component Size: 01005
- ◆ Detects part: position, missing, wrong, polarity, skew tombstone, etc.
- ◆ Detects lead: bent, lifted, bridging
- ◆ Detects solder: open, insufficient, short, solder bridge

Javelin Prober

- ◆ Flying prober with incorporated AOI.

Scorpion Prober

- ◆ Flying prober with incorporated AOI.

# Selective Soldering Systems



Ersa ECOSELECT 1  
Selective Soldering System

- ◆ PCB size, maximum: 66.5" x 59" x 63.5"
- ◆ Lower pre-heater with short-wave, dynamic IR emitters and Convection heater top side
- ◆ Use of mini-wave, mini-dip wave and area-soldering nozzle capable
- ◆ 2 solder baths (Lead & RoHS) to increase throughput
- ◆ Drop-jet fluxer with integrated monitoring
- ◆ Camera/ monitor to view the solder process
- ◆ Low energy and N2 consumption



Kiss-101  
Selective Solder System

- ◆ PCB size, minimum: 2" X 2" and maximum: 24" x 30"
- ◆ Universal PCB location rails
- ◆ 6mm and 12mm "bullet" nozzles
- ◆ Capable of heated Nitrogen to the solder nozzle
- ◆ Rapid setup and time to "first production" using the machine
- ◆ "Teach" functions or available "off line" programming
- ◆ Programmable solder wave flow rate
- ◆ Set the time/temp profile for each individual component type
- ◆ For maximized process control and TAKT time
- ◆ Absolute control over all critical process parameters
- ◆ Solder temperature interlocked within 2 degrees Celsius
- ◆ Height and travel speed of the solder wave
- ◆ Programmable initial pre-heat soak time



## Wave Solder

### Automatic Wave Soldering System



NU/Era Wave  
Soldering System

- ◆ PCB size, maximum 18" x any size
- ◆ Automatic in-line wave soldering system
- ◆ Capable of soldering SMT components on the bottom side

## Rework

### Automatic Rework System



APR 5000 XLS Advanced  
Package Rework System

- ◆ System provides small board precision
- ◆ APR 5000 XLS Advanced Package Rework System is an innovative Split Vision System
- ◆ Motorized X, Y, Z adjustments speed placement and help ensure process repeatability
- ◆ The advanced controls reduce operator fatigue, improve placement accuracy and provide process consistency.
- ◆ Incorporates dual stage pre-heaters and has the thermal capacity and control to execute precise profiles of both large and small PCBs

# Washing and Cleaning Systems



Typhoon Aqua Washing System

- ◆ Automatic in-line DI aqueous cleaning system
- ◆ High pressure nozzles
- ◆ Top and bottom controls for pressure
- ◆ Pre-wash section 2 top / 2 Bottom Spray Bars Supplied By 10 HP Wash Pump
- ◆ Wash Section 5 Top / 5 Bottom Spray Bars Supplied By 10 HP Wash Pump
- ◆ Rinse Section 5 Top / 5 Bottom Spray Bars Supplied By 10 HP Rinse Pump
- ◆ Final Rinse Section 2 Top / 2 Bottom Spray Bars Supplied By Customer DI Line
- ◆ First Dry Section 2 Top / 1 Bottom Fixed Air Knife Powered By 15 Turbine Blower
- ◆ Second Dry Section 2 Top / 1 Bottom Fixed Air Knife Powered By 15 Turbine Blower

Aqua Klean DI Water Treatment System

- ◆ Closed loop De-ionized water treatment system for aqueous cleaning



Alpha Metals  
Omega Meter 600 SMD

- ◆ Ionic testing and cleaning system
- ◆ Heated test solution improves solubility of contaminants per IPC- TM-650
- ◆ Self-contained system
- ◆ Submerged spray jets in test cell for increased contamination removal
- ◆ On board printer, prints contamination curve and test parameters
- ◆ This machine is the industry standard for ionic testing, it utilizes “static test” methodology on PCB and assemblies
- ◆ Operates with a heated, agitated extract solution that removes and accurately measures contamination that results in process residues from fabrication and board assembly processes
- ◆ Ideal for testing assemblies with SMT devices and complies with industrial specifications including MIL-STD-2000A, IPC- TM-650, and ANSI/J-STD001B

Omega Meter 500

- ◆ Ionic cleaning and testing system

## Debug Tools

Leader Lag 120B

- ◆ Function Generator

Troubleshooting Tools

- ◆ Tektronics oscilloscope, Model 465B, 2225
- ◆ LeCroy 1 GHz oscilloscope, Model LC574AL
- ◆ Fluke DVM
- ◆ Mentor Graphics emulator package for design debugging
- ◆ Variety of other debugging tools

## Thermal Cycling



TestEquity 3000  
Environmental Chambers

- ◆ -73°C to +175°C temperature range
- ◆ Over 10°C/ minute ramp rate without LN2
- ◆ Optional LN2 (liquid nitrogen) boost cooling for extra capacity
- ◆ 7 cu. ft. workspace, 24 w x 21 h x 24 d (198 Liters)
- ◆ Choice of original F4 controller or optional F4T touch screen controller
- ◆ Three event relays included
- ◆ High/ low limit control and alarm
- ◆ Viewing window and interior light
- ◆ 4" access ports on left & right side
- ◆ Non-CFC cascade refrigeration
- ◆ Scroll compressors for efficient and reliable operation

## Additional Tools and Equipment Available for the Following Areas:

- ◆ Inspection
- ◆ Printing
- ◆ Prepping of PCB and components
- ◆ Baking of PCB and components
- ◆ Rework and upgrade
- ◆ Cable/ Wire crimping and cable preparation
- ◆ Label printing

# SEM's Commitment to Quality

- Streamline Electronics Manufacturing shall manufacture and service its products to the highest quality standards of excellence.
- It is the commitment of SEM to support all of its employees' endeavors to ensure that the customer is not only satisfied, but also truly pleased with their choice of SEM as a supplier of their contract manufacturing needs.
- Each SEM employee is chartered with cultivating continuous improvement through quality and skills training.
- It is the responsibility of all SEM employees to ensure that all products and services enhance the company's ability to increase overall market share, reduce cycle times and reduce costs.





SEM

Streamline Electronics Manufacturing, Inc.