Our AWM-Automatic Wafer Mover™ provides a table top platform for safe, worry-free, single wafer handling between two industry standard cassettes.

This fully automatic microprocessor controlled notch finder model provides for wafer notch finding with minimal operator involvement.

Measures real time chemical concentrations in the cleanroom environments and integrated process tools.

Our AWM-Automatic Wafer Mover™ provides a table top platform for safe, worry-free, single wafer handling between two industry standard cassettes.
Aquarius® DI Water Heating System is the perfect solution for high purity DI Water heating applications where accurate temperature control is required.

18 CMP Flow Control
19 Slurry Injection System
20 CMP Retaining Rings
21 DNS Scrubber Brush Replacement kit
22 Vacuum Deposition Tools
23 SPIN Process Station
24 Spray Guns

25 Spin Processor & Coaters
26 Spin Processor Options
27 POLOS Precision Bake Plate
28 Portable Thin Film Measurement System
29 Vibration Sensors
31 Service & Consultancy
Low Contact Transfer

LCT series
Low contact bulk automatic low contact transfer systems provide a safe means of mass transferring wafers from cassette to cassette. Wafers are gently lifted midpoint in the cassette slots before extracting or loading them to minimize contact with the cassette which could cause particulation or wafer edge chipping. Optical and mechanical sensors combined with software logic guard against operation errors such as trying to transfer wafers into a cassette which is already loaded with wafers. User-friendly fail-safe operation features simple one-button actuation. Sturdy construction assures high reliability and robustness required in high throughput fabs. Small footprint saves valuable cleanroom space. Additional substrate sizes are available ultra thin wafer versions available (< 220 μm).

Custom LCT series
Bulk automatic low contact fragile/thin wafer transfer converted to allow a cassette to sit either h-bar down or h-bar up. Antistatic construction.

Automatic single wafer mover™
Our AWM-automatic wafer mover™ provides a table top platform for safe, worry-free, single wafer handling between two industry standard cassettes. Operators load the cassettes on to the stage and then can select a one-button-touch preset recipe run program, or they can direct the tool to map the wafers and then transfer wafers “manually” between cassettes.

The unique mapping end-effector detects and then safely moves a wafer from cassette to cassette. Standard AWM safety features include - wafer presence sensors, wafer protrusion sensors, cassette in place sensors, cross slot detection, double stack detection, emergency EMO switch, light tower and mapping logic software.

For 200 mm MEMS customers, TSV customers and Taiko or double sided wafer handling applications where a normal Wafer Mover end effector cannot make contact with the backside of the wafer, we can now offer you integration of a 200 mm mapping edge grip end-effector. This special end effector makes contact with the edge exclusion area of the wafer and grips the wafer during movement.
Wafer Sorting

SORT300
The SORT300 is an integrated cleanroom-system for sorting of 200 mm (8") or 300 mm (12") wafers. Three loadports can be loaded with carriers of different types (plastic or metal). Optionally a Carrier-ID can be read with a barcode-scanner.

The carrier occupation (mapping) is determined with an IR-optical sensor that is capable of detecting wafers thinned down to as little as 80 microns. A servo driven X-Y-Z-axis-system picks the wafers with a ceramic vacuum-grabber from the cassettes and places them onto a table moving with the robot for notch-finding.

After according rotation an OCR-string can be read by a specific camera that moves to the respective 8" or 12" radius position.

The SORT300 features fast turn-around cycles and supports a large number of sorting algorithms including lot-splitting from a 25-slot-cassette into two 13-slot-cassettes and vice versa the lot-merging. The system can be operated standalone or be connected to different types of control systems including SECS-GEM standard. For operation and process-visualization the SORT300 provides a user friendly operator-interface on a large graphical touch-display. Access to setup- and servicefunctions is code-protected in different levels. Adoptions to specific demands are possible at any time upon request.

WS300M 300 mm wafer sorter
Targeted for cost sensitive applications including R&D, test/assembly and application labs.

Compact portable design for moving single 300 mm wafers between any FOUP, FOSB or metal cassette. Operator friendly touch screen display provides for “manually” moving individual wafers, or “program handling” pre-defined groups of wafers between carriers. Only requires 120V/220V AC Power.
Wafer Sorters

Small footprint 2 or 4 cassette sorter. The FCS / CTS series is designed for automatic sorting based on wafer ID’s. The system consists of automatic tilting load-ports, wafermap-sensors, optical wafer notch/flat-aligner and a linear-robot. With this system it is possible to split, merge, sort, compress wafer-lots or create individual wafer-mix as desired.

CTS2015 Compact two cassette sorter with OCR & barcode reading

- 2 or 4 cassette port system configured for 150 & 200 mm wafers, thickness from 350 μm - 750 μm
- Exposed parts sealed hard anodized
- Ceramic fork for wafer pick and place to minimize wafer contamination
- Front access for cassette loading
- Soft turn-mechanism to turn cassettes from vertical to horizontal position
- Optical cassette mapping for wafer presence / absence
- Cross slotted wafer detection
- Computer: Industrial Panel-PC, 500 MhZ, 512MB Ram, 8 GB CF, 12.1” TFT-flatpanel, 12.1 “ touchpanel, keyport, mouse-touchpad, RS232-port, parallel-port and USB-port
- Operating system: TB-Ploner graphical user interface, WinXP-embedded and (VisualC).
- Standart functions: sort random, xfer, compress to top by slot, compress to bottom by slot, invert by slot, individual sort-function to program custom recipes
- Optional available with wafer flip function: flip (invert) wafer capability
- Optional wafer-alignment using non-contact LED/CCD edge detector

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info@sps-asia.com
End Effectors

Vacuum grippers
Special 10 mm edge handling end effectors for handling both 6", 8" and 12" wafers.

Key features:
- Saving in weight up to 50%
- Less particles regeneration
- Low cost
- High rigidity and flatness
- No scratch formation while handling silicon wafer
- Extreme resistance capability

Advanced carbon processing technologies
With our proven production of second-source ceramic arms, including complete media arms for semiconductor production, in carbon we offer great stability and mass reduction of up to 50%. Let us convince you to let us build your handling units!

Advantages:
- Mass reduction up to 50%
- Less particle generation
- Stable/robust
- Great rigidity and surface flatness
- Low initial costs
- No scratches at silicium-wafer-handling
- Extreme durability

Just send us your existing gripper, we’ll measure it with the help of our TESA Visio and will design a carbon gripper adapted to your application. We can build infinite versions of vacuum grippers, or pads for you. Our specialists in advanced technology of carbon processing can even laminate carbon plates, adapted to your application.

Be assured of our proven capability of high accuracy machining of carbon and surface precision by our specialists.

Better robots through superior hybrid bearing technology
- Increase bearing life
- Less tool downtime
- Lower particulate
- Increase yield
- Improve robot handling
Wafer Alignment

This fully automatic microprocessor controlled notch finder model provides for wafer notch finding with minimal operator involvement. To align wafer notches, the operator places the open bottom 300 mm carrier on the unit and pushes the “RUN” switch. All wafer notches are automatically aligned to the bottom, then, relocated to one of the 16 positions as set by the operator. LED indicates cycle in process and end of cycle.

Accuracy is better than plus or minus one degree. No manual operation or override is available. Rotation is controlled at a constant speed for minimal particulate generation. A 16-position rotary switch controls final wafer notch location. Standard adjustment points are 0, 2, 45, 88, 90, 135, 176, 178, 180, 182, 184, 225, 270, 272, 315 and 358 degrees.

Special thin wafer aligner can accommodate wafers as low as 88 μm thickness.
FOUP Opener

AFO self-contained automatic and manual FOUP door openers provide means to gain access to wafers off-line and keep the FOUP door cleaner. FOUP can be rotated on turntable for easy access to wafers. Small footprint saves valuable cleanroom space. Unique low profile design ideal for tabletop applications and FOUP wash stations.

FOMH Manual ergonomic dual-pistol grip design allows for FOUP door to be manually removed and then propped up by using handles as stand-offs. Simple designs for reliability and low maintenance.

Thin wafer FOUP insert kit
The SQ22758 insert assembly allows either 150 mm or 200 mm wafers to be loaded into a 300 mm FOUP. Ideal for bridge pilot lines, test-probe groups and 300 mm pre-production applications.

Quick and easy installation at user’s facility allows conversion in less than one minute without damaging FOUP. Can be removed and stored when not in use.

Standard and custom designs and materials are available for most industry FOUP models.

FOUP stand
Stand alone stainless-steel floor-mounted manual FOUP stand provides ergonomic safe means to gain access to wafers off-line. Operator-friendly design aligns FOUP, FOSB, or open bottom 300 mm cassette, with the operator’s body and line-of-sight.

The 360° degree rotation with positive stop points allows any operator to find a comfortable position for safely handling 300 mm wafers to/from the specified carrier. The FS-002 features a telescoping stand for ergonomically adjusting the height of the FOUP for tall or short operators. Table-top designs are also available.

Simple design for reliability and low maintenance. Cleanroom compatible. ESD protection insured by static dissipative plastics.
Metal Cassettes

300 mm thin wafer cassette
Lightweight ergonomic design minimizes weight and potential for operator fatigue. Made from welded hard clear anodized aluminum to provide dimensional stability over time and temperature changes. Features SEMI standard kinematic coupling positioners and info pad. Transfer compatible with all FOUP and FOSB carriers. Temperature: maximum recommended continuous operating temperature without causing distortion is 350ºC. Cassette features wafer retaining lock-bar for safe transportation of wafers in a horizontal wafer position.

Ultra thin wafer support with custom extended shelf design
Electro-polished SST, Peek or Teflon® coatings.

300 mm SEMI standard bake and process cassette
Lightweight ergonomic design minimizes weight and potential for operator fatigue. Made from welded hard clear anodized aluminum to provide dimensional stability over time and temperature changes. Temperature: maximum recommended continuous operating temperature without causing distortion is 350ºC. Features SEMI standard kinematic coupling positioners and info pad. Transfer compatible with all FOUP and FOSB carriers. Weighs only 6.5 lbs. Standard plastic FOUP weighs approximately 10 lbs. Cassette features wafer retaining lock-bar for safe transportation of wafers in a horizontal wafer position.

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Heavy-duty, self-contained portable Freedom Wand™ vacuum system. Sturdy custom tabletop production unit is designed for portable 300 mm wafer handling. Compatible with all our vacuum tips up to 300 mm. Unit is designed to provide 22” - 24” Hg vacuum for over 2 hours of continuous operation. SGI - Safe Grip Indicator light illuminates at 16” Hg to show operator it is safe to lift the substrate. Two rechargeable and interchangeable NiMH battery packs and charger station are included. Smart charger LED illuminates 20 minutes before discharge, allowing for battery change out. Tool is ESD safe and comes with grounding cord. Class 1 cleanroom compatible. 300 mm vacuum tip T3PKA1 included.

FWA3AS2
Portable self contained 300 mm vacuum wand with SGI - safe grip indicator light.

FWCR3
Portable self contained cordless 300 mm rescue vacuum wand.

300 mm Auto shutoff FWTTA1 table top portable freedom wand™. A popular custom version of the standard FWTTA1 platform. The FWTTA1-AC-004 has all the standard features of the FWTTA1 but includes a 300 mm shutoff holder and NO3T3PKAS1 vacuum wand assembly.

FWTTA1

SQ22949 Belt clip portable freedom wand™ auto shutoff. Custom heavy-duty self-contained portable freedom wand™ vacuum system. System is compatible with all our vacuum tips up to 300 mm. Wafer rescue operation belt clip mounted production unit is designed to provide 22” - 24” Hg vacuum for over 4 hours of continuous operation. White polypropylene base construction with press-fit NO3AS1 300 mm wand handle. FWTTA1 features LED shut-off holder to automatically turn system off when the vacuum wand handle is placed in holder. Internal battery pack with “smart” charger system keeps battery at full charge when attached to the power supply. Smart charger LED illuminates 20 minutes before discharge. Class 1 cleanroom compatible. 300 mm T3PKAS1 tip included. The SQ22949 series has multiple ordering part numbers.
Our line of photolithography mask & reticle picks and handling wafer picks equipment are the result of years of work with semiconductor companies and mask shops to provide a non-contaminating secure means of handling photo masks. With the stringent cleanliness requirements for submicron applications today, SPS-Europe mask handling tools have become indispensable.

**Features**

- Tangential edge-grip only: no front or back face contact.
- Compatible with most square reticles with pellicle and round masks with flats.
- Minimal moving parts for simple cleaning and low particle generation.
- Lightweight, economical and easy-to-use trigger-type gripping mechanism.
- V-type grippers allow masks with beveled edges to be loaded from flat surfaces.
- Various gripper widths and V-groove depths allow customizing for each application.

**MPS1 style**
General usage mask handling tool.

**MPV1 style**
For handling masks between mask cassettes.

**MPC MPH style**
Horizontal offset version of MPH.

**MPH90 style**
90 degree handle version of MPH.

**MPH style**
General usage mask handling tool.

**MPH “corner-corner”**
Special application mask handling corner grip tool.

**MCP**
Mechanical edge grip handling.
The Aquarius® Deionized (DI) Water Heater is the perfect solution for high purity DI Water heating applications where accurate temperature control is required. The Aquarius system is engineered to deliver high flows of continuous, at-temperature, hot DI water. The Power-to-Flow Control® feature found in the Aquarius provides one of the most accurate temperature controls available in a DI water heating system, and eliminates undesirable overshoots or drops in temperature. With models from 40kW to 225kW available, the Aquarius system provides an operational cost savings by reducing the need for multiple heaters.

**Power-To-Flow® Control**
Heateflex's patented Power-To-Flow Control is an innovative control system designed to provide accurate temperature output in single pass heating applications.

Power-To-Flow Control eliminates undesirable overshoots or drops in temperature. The sophisticated Aquarius® temperature control system features multi-loop capability and feed-forward functions to compensate for variations in the process flow rate. It measures the flow rate of fluid as it comes into the heater, measuring the temperature at various stages in the heating process, and then adjusting the proportion of power applied to each heating zone based on these measurements.

This advanced integrated control method reacts quickly to any variations in flow, providing a steady supply of DI water at a stable temp.
Maximum heating efficiency

esPRO heating technology provides the most efficient thermal response of any ultra-pure fluoropolymer heater on the market. At the core of esPRO heaters is our low mass, specialized heating coil with all PFA wetted surfaces. These heaters deliver maximum power in the smallest possible space. Built with all PFA or PFA/PVDF wetted surfaces, esPRO heaters are made to endure the ravages of aggressive chemical environments. This patented heating element allows for a rapid response to process demands. Because of the low mass of the esPRO heating element, in-line heaters are able to reach temperature set points in the shortest possible amount of time with a more even heat distribution.

Fluid Heaters

Ultra-pure PFA/PVDF in-line fluid heaters

esPRO series of ultra-pure in-line heaters are designed for use in industrial fluid heating applications such as semiconductor, solar cell wafer manufacturing, and other applications which require the most exacting standards of purity. Constructed of the highest-quality fluoropolymer materials, these heaters are custom designed and built for use with deionized water, acids, and other diverse process chemistries.

Benefits

- Heated chemicals at the point of use
- High efficiency and purity
- High reliability and low maintenance
- Compact size for ease of installation
- No nitrogen purge required

OEM Manifold & Matrix Upgrades

- Withstanding pressure 750 kPa
- Fluid temperature 15 - 50 °C
- Wetted parts PTFE
- Tube size ¾”

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SPS-Europe offers a broad line of immersion heaters for constant temperature baths and other processes that require the direct application of clean heat. Immersion heaters are compact and highly customizable, allowing for maximum work area to reduce the amount of process chemicals consumed. Immersion heaters heat efficiently and evenly for better temperature results.

**Features**
- All PFA wetted surfaces
- Ambient to 200 °C temperature range

**Safety interlocks to heater power**
- Over-temperature thermocouple

*Note: The immersion heater is designed for use with tanks of PVDF, PFA, or quartz. Please check with SPS Europe on compatibility with tanks of other construction materials.*

**Benefits**
- Heats harsh chemicals
- Compact and flexible in design
- Easily customizable
- No nitrogen purge required
Megasonic Cleaning

Our **megasonic cleaning systems and technology** can enable you to:
- Quickly, safely, and effectively clean contamination-sensitive products
- Improve your removal efficiency to above 99%
- Reduce process time

Using high-frequency acoustic energy, our advanced megasonics technology enables you to more tightly control your process and to make it faster and more efficient.

**Problems we solve include:**
- FEOL and BEOL cleans
- Post-CMP/polish cleaning
- Thick resist develop such as SU-8™
- TSV process enhancement and residual glue removal
- LIGA/MEMS process enhancements
- Solar process enhancement

**Megasonic tank**
- Operating frequencies from 400 kHz to 3 MHz.
- Power densities up to 2 Watts/cm².
- Process fluid temperatures to 60 °C.
- Single wafer to dual 200 mm.
- Available for use with own tank or as complete quartz direct-megasonic cleaning station.

**Direct megasonic batch system**
Patented metallic bond between PZT crystals and quartz resonator (No Glue) CW operation over the complete active area, all on, all the time, no switching (shorter process times). Patented RF transfer over spring buttons and RF distribution PCB, (No solder joints to break, no hot spots on the crystal) no water cooling layer required saves space, complexity of installation and water usage. LESS RF energy required for the same sonic energy levels in the process fluid. (up to - 8.3 db difference) higher uniformity of field in the process fluid, proven by actual measurement. Match network incorporated into the array housing, (best impedance match is right at the load) PZT crystal temperature monitoring, array mounted RTDs array forms the tank bottom and is removable and exchangeable with other similar tanks and IMPulse series electronics.

**Intelligent megasonics IMPulse 1000**
- Class D/E amplifier 85% + efficiency.
- Compact 19” 2u air-cooled package.
- Frequency synthesis via CEX (instead of VCO operation).
- Programmable pulsing, resolution to 1ms with a 10% duty cycle.
- Option to pull LOG DATA by run for alarms and process parameters.

**Single wafer megasonic MegPie™**
Ultrasonic Flowmeters

The esPRO flow meters are designed for contact-free precision flow measurement of high purity fluids. The ultra-pure PFA body contains no moving parts, eliminating any possibility for particle generation.

The esPRO flowmeter uses a non-contact ultrasonic sensor method, that detects the Karman vortex in your fluid. Light weight and compact, the esPRO flow meters compact design allows fitting on closely-spaced parallel piping. D-series are equipped with a small monitor and provide analog output, pulse output as well as high & low boundary output.

Key features
- Because PFA Flowmeters measure Karman Vortices using a non contact ultrasonic sensor method, they contain no moving parts such as flippers & floats, thus eliminating particle generation.
- High and low alarm boundaries can be set to any level using selector keys.
- Light weight and compact, ESPRO flowmeters are simple to install.
- Monitor attached series (V-xxD) and monitor unattached series (V-xx) are available depending on application.

Principle of operation
If a fluid flows past a shedder body, a regular pattern of vortices called Karman Vortex street alternately trails aft in the wake. The ultrasonic wave oscillating time varies proportional to the vortex shedding frequency. We can obtain the measured flow by detecting any changes in ultrasonic wave oscillating time.

The number of generated vortices is depending on the flow speed only and independent on other parameters as viscosity or specific gravity of the fluid.

Dimensions
Chemical Concentration Measurement

**Refractometer PR-23-MS**

Measures real time concentration of heated etching solutions in temperatures up to 160 °C. The concentration of dissolved solids is determined by making an optical measurement of a solution’s refractive index.

The PR-23-MS provides a continuous 4-20 mA or an Ethernet signal. This ensures immediate feedback to the control system if the chemical is out of specification.

**Typical uses:**
- Indicates bathlife and hot KOH concentration in silicon etch.
- Indicates bathlife and hot H₃PO₄ concentration in silicon nitride etch.

**Refractometer PR-33-S**

Measures real time chemical concentrations in the cleanroom environments and integrated process tools. Applications in the bulk chemical dispensing, and in point-of-use blending, spiking and monitoring applications. Simple OEM integration.

**Typical uses:**
- Prevents wrong chemicals or wrong chemical concentrations from being dispensed onto wafers.
- Indicates bathlife and timing for spiking in the BEOL wafer cleaning, e.g. for water in EKC.
- Monitors the H₂O₂ concentration in the blending and dispensing of CMP slurries.
- Monitors blending of SC-1
- Monitors TMAH concentration.

**Method**

Refractive index monitors are typically installed on the incoming hydrogen peroxide and raw slurry supplies, at the blending tank, and on the process feed.
Slurry flow controller retrofit kits for most CMP tools including Mirra®, SpeedFam IPEC, Strasbaugh etc.

Complete retrofit kit, consisting of a high-performance closed-loop flow controller, designed for use in wide variety of high-purity liquids including CMP polishing slurries. The kit contains all necessary parts.

Features for the liquid flow controller:
- High accuracy - controls flowrate to within ± 1% of setpoint; ideal for fluid blending and/or dispense applications.
- Fast response 3 seconds (typically < 2 seconds for most applications).
- Broad application range with 2 types of control valves.
- Wide range of flow control capability; 5 mL/min - 12000 mL/min (turndown can be as high as 100:1).
- All PTFE/PFA wetted part construction-insures compatibility with CMP slurries (slurry module with Pt cured silicone tubing).
- Low maintenance - modules featuring ultrasonic flowmeters with NO moving parts provide the ultimate in “uptime” (slurry module with pinch tube replacement cycle of 3 years or longer).

Mirra® and Reflexion® are registered trademarks of Applied Materials.
The innovative high efficiency slurry injection system now supports both 200 mm and 300 mm platforms on Applied Mirra® polishers. The complete SIS-100M hardware for the Applied Mirra® polisher consist of an injector, an injector mount and a mounting clamp.

As more metal levels and CMP steps are added to devices, the associated consumable costs, (slurry, pads and conditioners) are climbing exponentially. The slurry delivery system reduces slurry usage dramatically. Test results have shown cost savings between 20 – 40%, depending on which pad/slurry combination was used.

This slurry delivery system is now being used at multiple SEMATECH member company sites. By manipulating biproduct residence time on the pad, the SIS can alter slurry temperature by as much as 1 ºC. It offers a simple and non-intrusive system, that can easily be integrated with an HMV (High Volume Manufacturing) polisher.

The SIS will show substantial slurry savings (based on volume) below the POR (Preferred Operating Region) flow rate while maintaining the POR removal rate, as well as an equivalent or better within-wafer non-uniformity as compared to the POR.

- Uses existing slurry plumbing
- Does not require the removal of the slurry applicator or injector that comes with the polisher
- Requires no process changes except slurry flow rate or polish time reduction
- Can be installed and removed rapidly (in less than 2 minutes) for pad changes
- Requires no power
- Does not require changes in the polisher software
- Does not require physical modification of the polisher
- Polisher interlocks do not have to be disabled

Mirra® and Reflexion® are registered trademarks of Applied Materials.
Compatible CMP retaining rings for AMAT, EBARA, SpeedFam/IPEC Strasbaugh etc.

Not all options are listed, all retaining rings are available with a choice of PPS, PEEK, or X3G for the polishing face. We can customize any of our designs to meet specific needs: Alternate polymers for the polish face, custom slurry groove geometry, non-standard thicknesses, etc. Our engineering team will be happy to work with you to develop a solution that meets your requirements. All of our Acies line of retaining rings are supplied in a “broken in” or “pre-polished” condition. We can apply this process to any of our retaining rings on request. All CMP rings are permanently marked with serial numbers traceable back through manufacturing to raw materials. Many designs are also suitable for our Extended Life Ring - refurbishment program - Contact SPS Europe for details.

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DNS Scrubber Brush Replacement kit

Brush replacement cleaning system
DNS scrubber brush replacement kit featuring the proven 200 mm sapphire MegPie and IM Pulse 200 electronics suite.

200 mm sapphire MegPie integration kit with manifold including:
- Extension ARM Assy. (hard Anodized Aluminum)
- MegPie mounting and adjustment assy.(316 SS)
- 200 mm sapphire MegPie transducer with integrated RTDs.
- WashPod assy (PP Natural).
- Process fluid delivery manifold (PTFE).
- Optional 2nd dispense arm.

Single wafer cleaning - DNS / OnTrak scrubbers
Upgrade your scrubbers from brush/nozzle to single wafer megasonic for enhanced wafer cleaning, improved uniformity, and zero maintenance or downtime.

Upgrade provides:
- Non-contact clean
- No consumables
- Zero particle adders proven
- Documented PRE elimination of cross contamination
- Process control alarms
- SPC data via fab network

OEM replacement for Akrion Phaser / Gama benches, FSI Dolphin, PCT, Mirra Mesa etc.

Upgrade provides:
- New direct megasonic technology
- Improved uniformity & cleans
- Exceptional MTBF (no glue bonds or solder joints to fail)
- Feedback loop for real-time monitoring
- Process control alarms
- SPC data via fab network

Direct upgrade for old indirect tanks. We can upgrade almost all older indirect technology to the new direct technology systems, with the same substantial process benefits and costs savings - all offering a quick ROI.
**Vacuum Deposition Tools**

**Atomic layer deposition system**
ALD technology has taken a leap in the past couple of years. SPS-Europe offers various systems, including a table top version for surface controlled layer-by-layer deposition with atomic layer accuracy.

**Table top ALD systems**
There is a need for deposition equipment optimized for growing conformal thin films at smaller scales at a reasonable cost. The AT400 4" system accomplishes these goals and fills a space in the market.

**Large substrate and precursor temperature ranges**
- Chamber temperatures from RT to 350 °C
- Precursor temperatures from RT to 150 °C ± 2 °C with opt. heating jackets

**Fast cycling capability**
- 6-10 cycles/min or up to 1.2 nm/min of Al₂O₃ (best in class)

**Up to five ALD precursor sources at one time**
- Three (3) organometallic or other metal containing sources all up to 150 °C

**Features**
- Smallest Footprint on the market: 55 cm (W) x 55 cm (D) X 39 cm (H)
- Cleanroom Compatible
- Weight 45kgs

- 2 Counter reactants - standard
- 1 liquid source such as H₂O or H₂O₂
- 1 gas source such as O₂ or NH₃
- 2 gas sources can be used as well

- Variable process pressure control 0.1 to 1.5 Torr
- All metal sealed system upstream of sample
- Up to 3x Heated sources
- Volume controlled dosing (Volume control yields more repeatable precursor doses)
- Valve time controlled dosing
- Exposure Control
- Point source Gas Distribution with Optimal Spreading for superior film uniformity
- Integrated, angled HMI/PLC SW/Controls (prevents random SW lockups)
- Robust 7" touchscreen PLC control system
- Recipe Control: proven recipes pre-loaded in controller

**NEW! 6” systems also available! AT600**

**Vacuum Deposition Tools**

**7” touchscreen display with complete control over operation of the tool, recipe generation and sensor date. Easy to use and robust control SW interface**

**Optional upgrades**
- Ventable Precursor Cabinet
- ATOzone – Integrated ozone generator
- Inert Gas Pressure Assist (AT-IGPA)
- Precursor bottles Anric Technologies | AT-400 6
- Precursor bottle heaters
- Spare deposition chamber
- Glovebox integration
An extremely versatile platform for a wide range of processes. Based on the proven high quality POLOS single substrate spin processor, the modular design spin process station provides excellent value for money: full plastic construction, with high-end components, compatible with any chemical environment in a modular set-up, suitable for your specific requirement.

The seamless integration of polypropylene (optional PTFE) spin processor in the base station allows you to work with all kinds of chemicals. In the station housing various modules can be incorporated and centrally controlled for supply of chemicals and gases.

Standard configurations are available for cleaning substrates as well as photomasks, photoresist coating, developing, etching and lift-off processes.

Value for money
Fully automatic, accurate and repeatable processing:

**Automatic linear dispense arm**
- Freely programmable static, dynamic or oscillating chemical dispense.
- High pressure and/or megasonic cleaning directly to any point on the substrate. Static chemical dispense through a range of adjustable nozzles in the domed lid. Adjustable back - side spray arm. Heavy duty motor: programmable for 1 to 12,000 rpm. CW & CCW rotation allowing puddle mode.

**Freely programmable process**
- Sequentially programmable multiple dispense lines.
- Stepless programming of various flows within a process step from 150 up to 2500 mL/min (depending on dispense line thickness). For optional integrated mixing systems, the mixing rates of the various chemicals can be programmed per step.
Spray Guns

Spray guns (SG)
Our spray guns are constructed of virgin PTFE and polypropylene to provide them with a long life span in harsh acid corrosive environments. Due to their design and comfortable grip spray guns are quickly becoming the industry standard in semiconductor fab plants, wet benches and work processing stations. All the spray guns may be purchased individually or with a variety of fittings and hoses.

DI spray/rinsing guns
Max. operating pressure - 75 PSI
Media temperature range - 40 ºF - 130 ºF

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG-103</td>
<td>Standard spray gun with ½” FNPT inlet thread.</td>
</tr>
<tr>
<td>SG-102</td>
<td>Spray gun with ¾” FNPT inlet thread.</td>
</tr>
<tr>
<td>SG-101</td>
<td>SG-101 spray gun with ¾” FNPT inlet thread.</td>
</tr>
</tbody>
</table>

Note: add - FT for front trigger option.

Nitrogen guns (Nitro)
Our PTFE nitrogen guns (Nitro) can deliver maximum anti-corrosion protection wherever extreme chemical environments are used in the vicinity of nitrogen dispensing or drying. Like its companion, the DI water spray, Nitro is manufactured of the same durable materials to resist acid attacks.

Nitrogen guns/drying guns
Max. operating pressure - 75 PSI
Media temperature range - 40 ºF - 130 ºF

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitro-1</td>
<td>Standard nitrogen hand spray with ¼”FNPT inlet thread, filter housing with disposable filter.</td>
</tr>
<tr>
<td>Nitro-2</td>
<td>Same as Nitro 1 only using a standard spray gun body configuration.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source part no.</th>
<th>Gun</th>
<th>Hose assy.</th>
<th>Fitting</th>
<th>Fitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>NITRO-3</td>
<td>NITRO-1</td>
<td>C4-PU</td>
<td>J44</td>
<td>J44</td>
</tr>
<tr>
<td>NITRO-3T</td>
<td>NITRO-1</td>
<td>C4-FEP</td>
<td>MC-F-44</td>
<td>MC-F-44</td>
</tr>
<tr>
<td>NITRO-4</td>
<td>NITRO-2</td>
<td>C4-PU</td>
<td>J44</td>
<td>J44</td>
</tr>
<tr>
<td>NITRO-4T</td>
<td>NITRO-2</td>
<td>C4-FEP</td>
<td>MC-F-44</td>
<td>MC-F-44</td>
</tr>
</tbody>
</table>

Note: add - FT for front trigger option (NITRO-4 and NITRO-4T only).
POLOS SPIN150i and SPIN200i
The versatile, high-quality natural polypropylene POLOS SPIN150i and SPIN200i single substrate SPIN processors are specifically designed for R&D and low volume production. Suitable for all typical SPIN processes: cleaning, rinse/dry, coating, developing and etching. Systems are also available in all-PTFE construction for specialist applications.

These well-proven models are ideal for processing a wide range of substrates from small fragments with a diameter of 5 mm up to 160 mm / 260 mm or square samples with dimensions 100 x 100 mm or 150 x 150 mm. Systems capable of up to 450 mm diameter are available.

System benefits:
- High-speed acceleration up to 0 - 12,000 rpm in 0.3 sec.*
- A detachable touch screen control panel for use outside a glove box. (uses CAT5 cable)
- Programmable CW & CCW rotation enables specialist processes such as ‘puddle’ develop and/or etch.
- Engineering plastics, high quality seamless fabrication.
- Lid and Bowl liner sets in anti-static PET.

* Depending on substrate size and chuck type

The units are operated via an easy to use, detachable colour touch-screen that offers intuitive programming and recipe storage. A variety of nozzles, megasonic cleaning and dispense lines can be added as options.

Systems also available for: Up to 450 mm wafers
MegPie megasonic transducer
The sapphire MegPie is a single-wafer megasonic transducer for cleaning and sonochemical processing. It applies a uniform dose of acoustic energy to a rotating substrate. The MegPie will improve process efficiency and lower process time.

Applications:
- Post-CMP cleaning
- LIGA processes
- TSV processing
- Mask cleaning
- Pre-SOIC bond cleaning
- Etch assist
- SU-8 develop
- Plating pre-cleaning
- Lift off
- Pre-plating bubble removal
- Resist strip
- Post-laser cleaning

Peristaltic pump

Features
- Dispense a set volume from a reservoir.
- Dispensing and with drawal pumping
- Additional pumping heads available for quick change.
- Time saving learn and repeat™ mode.
- Slow down and anti-drip modes improve dispensing accuracy.
- Calibration mode improves instrument repeatability.
- Fully programmable with computer interface for more advanced applications.
- Store and select from up to 40 dispenses.
- Easy-to-use keypad interface.
- Compact design 7¾” (L) x 5¼” (W) x 5¾” (H).
The modular setup of this new table top hotplate enables easy plate (chuck) exchange and upgradeable options, making this a versatile and affordable tool for R&D and pilot lines. The POLOS hotplate is available for processing single or double substrates. A precision digital temperature controller enables adjustable temperature steps of 1 °C up to 230 °C. It is suitable for soft bake as well as hard bake processes, and curing of photo resist, epoxy or any other work requiring precise temperature control.

**Standard models for substrate sizes 150 and 200 mm.**

### Features
- Diagnostic serial interface (RS232)
- Precision temperature controlling system. Uniform temp.: +/- 0,5 °C
- Digital temperature controller: adjustable in steps of 1 °C
- Countdown timer (1-999 sec.) with acoustic alert

### Options
- Hinged lid
- Proximity pins
- Lifting pins
- Vacuum bake

### Operational environments
The system is designed for an ambient temperature of 10 °C - 40 °C.

<table>
<thead>
<tr>
<th>Measurement &amp; Weight</th>
<th>HL150S</th>
<th>HL200S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight:</td>
<td>12 kg</td>
<td>12 kg</td>
</tr>
<tr>
<td>Dimensions device:</td>
<td>450 x 320 x 135 mm</td>
<td>450 x 320 x 200 mm</td>
</tr>
<tr>
<td>Dimensions with Hinged Lid:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Portable Thin Film Measurement System

Accurate & USB-powered film characterization for point-of-need applications

FR-pOrtable is a unique turn-key solution for accurate & precise optical characterization of transparent and semi-transparent single films or stack of films. With FR-pOrtable the user can perform reflectance measurements for films in the 350-1000μm spectral range. In just one click, we characterize thin & thick transparent and semi-transparent films by analysing light reflection. Get rid of power cables and large lab space requirements. Thanks to its unique design, FR-pOrtable draws power from the USB cable that is used for its control from the computer. FR-pOrtable is built around a miniature 3648 pixel 16 bit resolution spectrometer and a high stability hybrid light source that combines incandescent lamps and LEDs. The average light source life time is 20000h, and all its features, such as optical power, emission spectrum, stability etc., are controlled through the embedded μcontroller. The compact design of FR-pOrtable and the custom designed reflection probe, guarantee high accuracy and repeatability of the performed measurements.

FR-pOrtable, can be either mounted on the supplied stage or can easily be transformed to a handheld thickness measurement tool to be placed over the sample under characterization. This way, FR-pOrtable is the optical characterization tool for in the field applications.

FR-pOrtable unique features
- Powered through USB, no-power cable is required.
- Really portable, probe sits over the sample.
- Materials are ideally suited for in field applications.
- Its small footprint brings film characterization in the office.
- The lowest price in the market.

For Microfluidics applications capable of measuring multiple layers, e.g. the air layer under a membrane.

<table>
<thead>
<tr>
<th>Specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness range</td>
<td>20 μm - 90 μm</td>
</tr>
<tr>
<td>Spectral range</td>
<td>350 μm - 1000 μm</td>
</tr>
<tr>
<td>Detector</td>
<td>3648 pixels Si CCD array, 16Bit A/D resolution</td>
</tr>
<tr>
<td>Accuracy</td>
<td>1 μm</td>
</tr>
<tr>
<td>Spot size</td>
<td>&gt;0.5 mm</td>
</tr>
<tr>
<td>Light source</td>
<td>Hybrid light source, combining LEDs and incandescent bulb (360 μm - 1050 μm)</td>
</tr>
<tr>
<td>Sample size</td>
<td>10 - 150 mm, irregular shape</td>
</tr>
<tr>
<td>Power requirements</td>
<td>USB-powered</td>
</tr>
<tr>
<td>Dimensions / weight</td>
<td>300 mm (w) x 110 mm (l) x 40 mm (h) / 600 gr</td>
</tr>
</tbody>
</table>
Vibration Sensors

VS-series vibration sensors
Provide advanced warning when machine conditions are deteriorating, allowing engineers to take preventive action and avoid failure and losses.

- Diagnostic for tool integration
- Monitor trends of vibration conditions
- Detect dynamic problems

Our vibration sensors feature
Fingertip-size sensor head allows for easy fitting:

- Measuring 3 directions (X, Y, Z)
- High output data >200 measurements/sec
- Simple and convenient USB plug-n-use operation
- Seamless integration via SECS / GEM
- Tool integration or mobile use, on-/off-line monitoring

Subcase study 1

The VS-1™ was used to detect the vibration of the pad conditioner arm. The yellow arrow Y indicates the sweeping movement of the PC Arm.

Readings show Z-axis vibration to be high at the centre of the pad. Follow-up investigation found that the high pressure rinse DIW nozzle spray was weak at the pad centre area. This will lead to low cleaning efficiency at pad centre area and induce pad glazing and microscratch issues.

Subcase study 2

Detected polisher platen bearing abnormality and resolve motor torque and point failure issue.

- Issue: Z-axis experience high working vibration and wafer polish endpoint unstable (motor torque)
- Root cause: found platen bearing worn out to cause PC Z-axis vibration high
- Corrective Action: change platen bearing, vibration level back to normal baseline

Rusty bearings that caused the unstable torque

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Rusty bearings that caused the unstable torque
Vibration Sensors

VS-BTTM vibration sensor

- Real time monitoring capability
- Vibration stability index capturing the overall stability of a complete work cycle
- Higher yield rates
- Higher profit margin

VS-BTM vibration sensor

- Advance statistical calculation
- Wireless transmission
- High sampling rate
- In-built SECS/GEM capability

<table>
<thead>
<tr>
<th>Specification</th>
<th>VS-1 Sensor</th>
<th>VS-1º Sensor</th>
<th>VS-2º Sensor</th>
<th>VS-BTM Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement of acceleration</td>
<td>3 Directions (i.e. X, Y, Z)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement range</td>
<td>+ / -2g, 4g, 8g, 16g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-linearity</td>
<td>0.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity change due to</td>
<td>0.01% per 1 °C</td>
<td>0.02% per 1 °C</td>
<td>0.01% per 1 °C</td>
<td>0.02% per 1 °C</td>
</tr>
<tr>
<td>temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.01g</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Output data rate</td>
<td>0.1 to 3200Hz</td>
<td>200Hz / 1000Hz</td>
<td>100Hz / 400Hz</td>
<td>200Hz / 1000Hz</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20 to 80 °C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>10000g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog output (X, Y, Z)</td>
<td>-</td>
<td>0 – 10 VDC</td>
<td>0 – 10 VDC</td>
<td>0 – 10 VDC</td>
</tr>
<tr>
<td>Supply voltage range</td>
<td>-</td>
<td>10 – 30 VDC</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Our products and services enable engineers to “make more with less” using “tomorrow’s technology with today’s tools” with proven ROI - in some cases just a few months. Part of that includes offering specialist services including on-site upgrade installations, servicing and consultancy.

Service & upgrades

Wafer automation
On-site servicing across the entire range of TB Ploner wafer sorters, ID mappers, and transfer systems. Customised in-house training on both operation and maintenance.

Wet bench automation
On-site upgrade for old Akrion robot wet benches - replacing the old automation with a modern, high reliability long-life unit.

CMP flow control
On-site upgrading of peristaltic pumps to high precision flow controllers for major slurry cost savings, increased yield and zero maintenance downtime. Rapid ROI.

On-site process development, customisation and installation of a CMP Slurry Injection System - the extra margins for slurry savings and process yield improvement. Rapid ROI.

Wet clean upgrades
On-site upgrading of DNS scrubber nozzle or brush to the latest technology single-wafer megasonic cleaner. Replacement of Mirra® Mesa megasonic cleaning tank with a high reliability long-life unit.

Direct megasonic tank upgrades
Replacement of old indirect tanks with modern Direct megasonic process tanks. Major improvement in process technology with far greater uniformity and efficiency. Modern direct megasonic tanks do not consume N2 or cooling DI, and use only a fraction of the power the old indirect baths use. Rapid ROI.

Consultancy
With over 25 years of collective experience solving different kinds of process and production problems in every kind of fab - we have seen and solved many issues.

Talk to us - we may already have the solution +31 341 360 590.
For 30 years SPS - Europe has offered quality products and services as a one-stop shopping point for front-end semiconductor manufacturers and related industries. We supply a range of industry leading products used worldwide for Wafer Handling, Wet Processing, Photolithography, OEM Replacement parts and the Solar industry. Dedication towards our customers and flexibility in finding the right solution, combined with solid application knowledge and fast supply logistics, are the keywords of our service. SPS-Europe B.V. is a full-service distributor offering full-time service engineer support for the systems we supply. We manufacture our own SPIN150™ and POLOS™ spin coating systems - widely installed across the world.