



Cooling Stages

Recirculating Heaters
and Chillers

Film Thickness Monitors

Sputter Coaters

SEM/TEM Carbon Coaters

Vacuum Evaporators

Glow Discharge Systems

RF Plasma Etchers/
Plasma Reactors

Critical Point Dryers

Freeze Dryers

Cryo-SEM Preparation
Systems

Vacuum Pumps & Accessories

Evaporation Supplies

well equipped...

EMS is committed to providing the highest quality products along with competitive pricing, prompt delivery and outstanding customer service.

not just products...

Electron Microscopy Sciences is pleased to announce that a new brochure for electron microscope specimen preparation equipment is available, including 20 pages of articles reviewing electron microscope preparation techniques. These are:

- Sputter Coating Techniques and Applications
- Silver as a Removable Coating for Scanning Electron Microscopy
- Carbon Coating Techniques and Applications
- Plasma Etching and Ashing Techniques and Applications
- A summary of the Critical Point Drying Method
- Freeze Drying Principles
- Cryo-SEM — the Advantages



The new brochure as well as the EMS printed catalog and CD-ROM eBook can be ordered on line.

For more information, please visit our website at www.emsdiasum.com



**Electron
Microscopy
Sciences**

Electron Microscopy Sciences
P.O. Box 550 • 1560 Industry Rd. • Hatfield, Pa 19440
Tel: (215) 412-8400 • Fax: (215) 412-8450
email: sgkcck@aol.com • www.emsdiasum.com

Side-By-Side Comparison? Difficult When Our Coaters Stand Alone.



High Resolution Sputter Coater 208HR for FE-SEM

Superior Features:

- High Resolution Fine Coating
- Wide Choice of Coating Materials
- High Resolution Thickness Control
- Multiple Sample Stage Movements
- Wide Range of Operating Pressures
- Compact, Modern, Benchtop Design



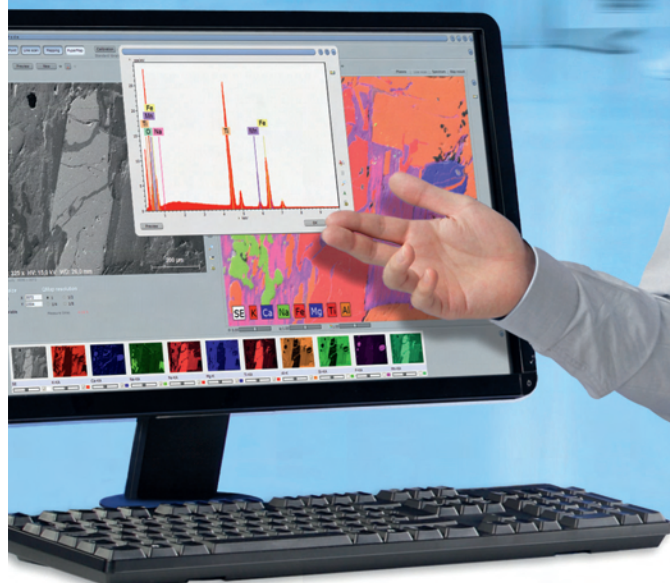
Find out about our complete line of sample coaters.

TED PELLA, INC.
Microscopy Products for Science and Industry

4595 Mountain Lakes Blvd., Redding, CA 96003-1448
Phone: 530-243-2200 or 800-237-3526 (USA) FAX: 530-243-3761
Email: sales@tedpella.com Web Site: www.tedpella.com



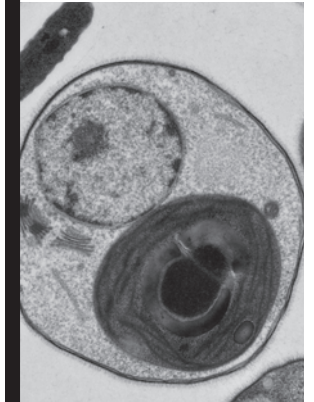
QUANTAX – Ultimate EDS for SEM and TEM



- Data collection at the highest speed and at the best resolution you can get – first class results no matter the circumstance
- Excellent light element performance with $\text{Mn K}\alpha \leq 123 \text{ eV}$ ($\text{F K}\alpha \leq 54 \text{ eV}$, $\text{C K}\alpha \leq 46 \text{ eV}$) even at 100,000 cps
- Best acquisition conditions for sensitive and rough samples through unique multi-detector systems and optimum geometry using VZ-Adapters
- Genuine standardless P/B-ZAF quantification for rough samples and VZ applications, Cliff-Lorimer quantification for TEM

www.bruker.com/microanalysis

A perfect 10⁻⁹



Your image starts

HERE

Join the
Perfect 10⁻⁹ Group today.
[leica-microsystems.com/
yourimage](http://leica-microsystems.com/yourimage)

... is only possible with perfect EM
sample preparation.

No matter what type of imaging instrument you use; TEM, SEM, LM, Confocal or AFM, the ultimate quality of the image comes from high-quality sample preparation. Leica Microsystems has a full range of innovative instrumentation to deliver perfect preparation for all sample materials.

- Sectioning
- Processing
- Staining
- Planing
- Target Polishing
- Ion Milling
- Contrasting
- High Pressure Freezing
- Cryoprocessing and Transfer
- Coating and Drying

A **perfect 10⁻⁹**! See the difference Leica Microsystems quality can make for you.

Visit www.leica-microsystems.com/yourimage

Living up to Life

Leica

MICROSYSTEMS

Flash & GTM

ARM200F TEM with Cold FEG

GaN [211] HAADF at 200 kV

ABF, HAADF and EELS
 $\text{Ca}_3\text{Co}_4\text{O}_9$ (110)

Data courtesy of Dr. Robert Klie,
University of Illinois at Chicago

Visualization of hydrogen atomic columns in YH_2
by ABF imaging (Y = red, H = green) Data courtesy
of Ryo Ishikawa and Dr. Eiji Abe (The University of Tokyo)

Unrivalled flash speed
Unrivalled raw data

Visit www.jeolusa.com/FlashandGo



JEOL

Another
Extreme Imaging
Solution

Global Solutions Provider for Advanced Technology
www.jeolusa.com • salesinfo@jeol.com
978-535-5900



Atomic Resolution S/TEM

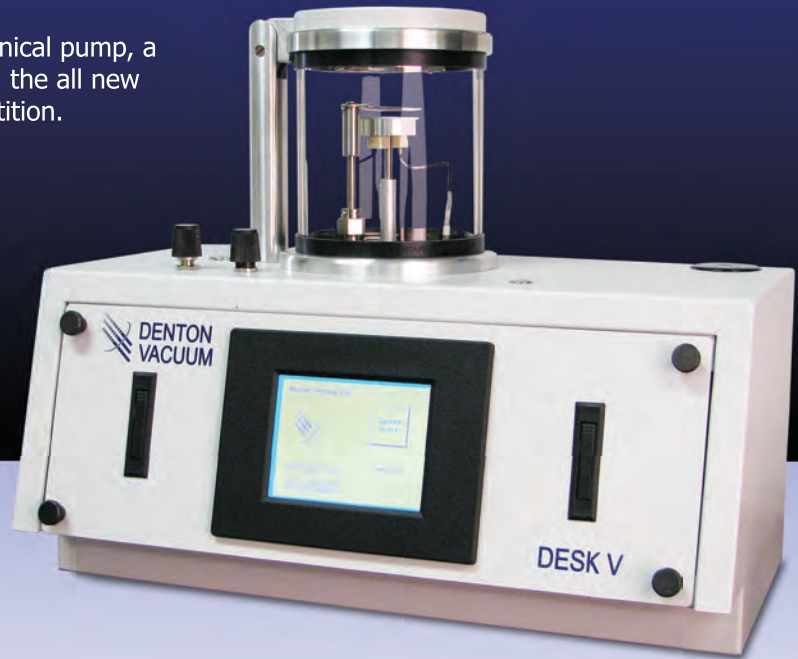
FIVE GENERATIONS OF PERFORMANCE...REFINED

The new Desk V HP sputtering tool.

With an enhanced sputter head, larger mechanical pump, a more powerful PLC and a larger power supply, the all new Desk V HP is generations ahead of the competition.

Features:

- Short deposition times
- Consistent deposition parameters
- Enhanced touchscreen controls
- Film thickness control
- Etch mode for sample cleaning
- Wide variety of coating materials
- Compact benchtop design
- 85 LPM Mechanical Pump



Call us today at 800-666-6004
or visit us online at www.dentonvacuum.com



OREGON PHYSICS
High Brightness Ion Beams

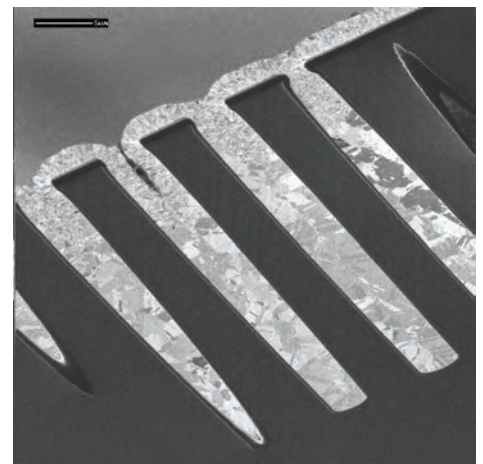
$$\nabla \cdot \mathbf{E} = \frac{\rho}{\epsilon_0}$$

$$\nabla \times \mathbf{B} = \mu_0 \mathbf{J} + \mu_0 \epsilon_0 \frac{\partial \mathbf{E}}{\partial t}$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$



- ❖ Custom apertures
 - Aperture strips
 - Beam acceptance apertures
- ❖ FIB consumable replacement parts
 - Extractors
 - Suppressors
- ❖ Large area plasma FIB milling service work



Vias fabricated at IMEC while developing their fabrication process. Plasma FIB cross-sectioned and imaged at Oregon Physics.

Oregon Physics LLC, 2704 SE 39th Loop, Suite 109
Hillsboro, OR 97123 USA

oplab@oregon-physics.com www.oregon-physics.com

Tel/FAX: +1-503-601-0041



**the highest quality...
the most precise sectioning...
incomparable durability**

Free customer service

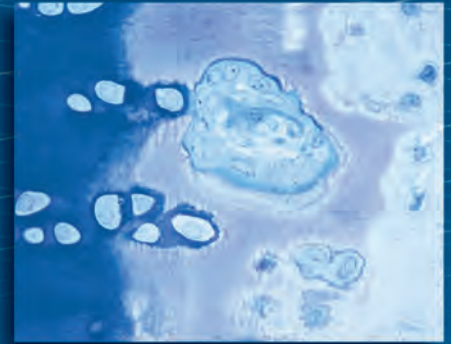
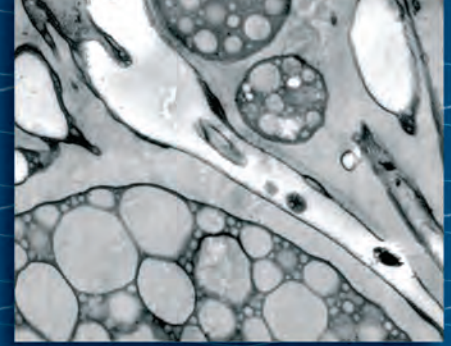
Sectioning tests with biological and material research specimens of all kinds. We send you the sections along with the surfaced sample, a report on the results obtained and a recommendation of a suitable knife. Complete discretion when working with proprietary samples.

Re-sharpening and reworking service

A re-sharpened Diatome diamond knife demonstrates the same high quality as a new knife. Even knives purchased in previous years can continue to be re-sharpened. The knives can be reworked into another type of knife for no extra charge, e.g. ultra to cryo or 45° to 35°.

Exchange service

Whenever you exchange a knife we offer you a new Diatome knife at an advantageous price.



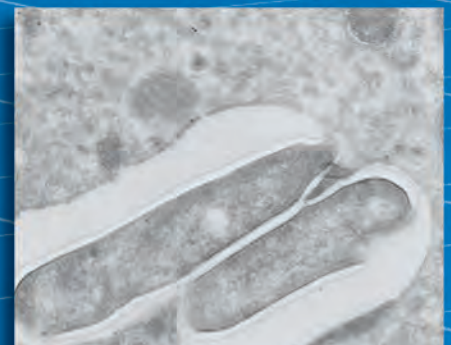
40 years of development,
manufacturing,
and customer service

DiATOME

diamond knives

Electron Microscopy Sciences
P.O. Box 550 • 1560 Industry Rd. • Hatfield, Pa 19440
Tel: (215) 412-8390 • Fax: (215) 412-8450
email: sgkck@aol.com • www.emsdiasum.com

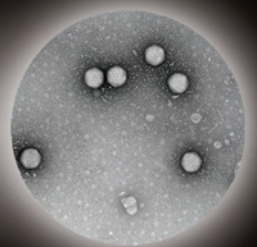
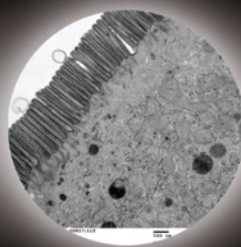
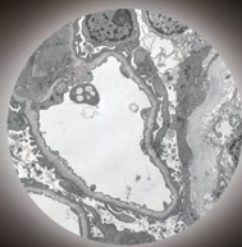
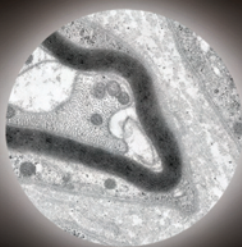
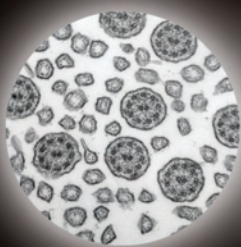
ultra 45° • cryo • histo • ultra 35° • STATIC LINE II
cryo-P • cryo immuno • ultra sonic • cryotrim 45 and 25
ultra AFM & cryo AFM • cryo 25°





High Definition Digital
TEM Cameras with
1 to 16 Megapixels

- AMT SOLUTIONS
- Life Science Cameras
- Material Science Cameras
- Easy To Use Software
- Reliability and Services
- TEM Integration
- Extensive Support



3 Electronics Avenue, Danvers, MA 01923 • Phone: 978.774.5550 • www.amtimaging.com

SPI Supplies. Vacu Prep II™

- Clean
- Fast
- Easy
- Reliable
- Turbo molecular pump



just a click away.

2spi.com/vacuprep2

The SPI Supplies Vacu Prep II™ is a fast, clean, high vacuum, bench top evaporator with simple automated operation for evaporation or sputtering. It utilizes solid state electronics to control the pumpdown, evaporation and venting sequences. A turbo molecular pump is the heart of the system, but it still fits on the bench top.

Safe, reliable, and easy to maintain, the Vacu Prep II can be used for routine carbon coating or the evaporation of various metals and materials.

With quick pump down times, the system can quickly achieve an ultimate base vacuum in the 10^{-7} torr range. The Vacu Prep II features a large baseplate that accommodates more feed-throughs, more fixturing, and more applications.

Short Pump Down Cycles

The compound turbo molecular pump operates at a speed of 65 liters/second to achieve excellent base vacuum levels and gas load handling.

Powerful Control System

A touch screen interface provides full control for the following modes: service, manual, and semi-automatic. Standard software makes it easy to support and avoid costly customization fees. The safety interlock will mitigate damage to the operator and equipment.

Typical Applications

- Electron Microscopy Sample Preparation
- High-Vacuum Carbon Coating for TEM and X-Ray Analysis
- Resistance Evaporation of Metallic Compounds
- Carbon Support Films
- Carbon Platinum Replicas
- Rotary Shadowing
- Aperture Cleaning
- Asbestos Analysis
- Failure Analysis

The Vacu Prep II has a size of 31" w (78.7 cm) x 28" d (71.1 cm) x 30" h (76.2 cm) and weighs 250 lb (113.4 kg). Large chamber up to 12" diameter (30.5 cm) x 18" h (45.7 cm) provides ample space for evaporation and sputtering applications.

It is available in 110V (12200-AB) and 220V models.

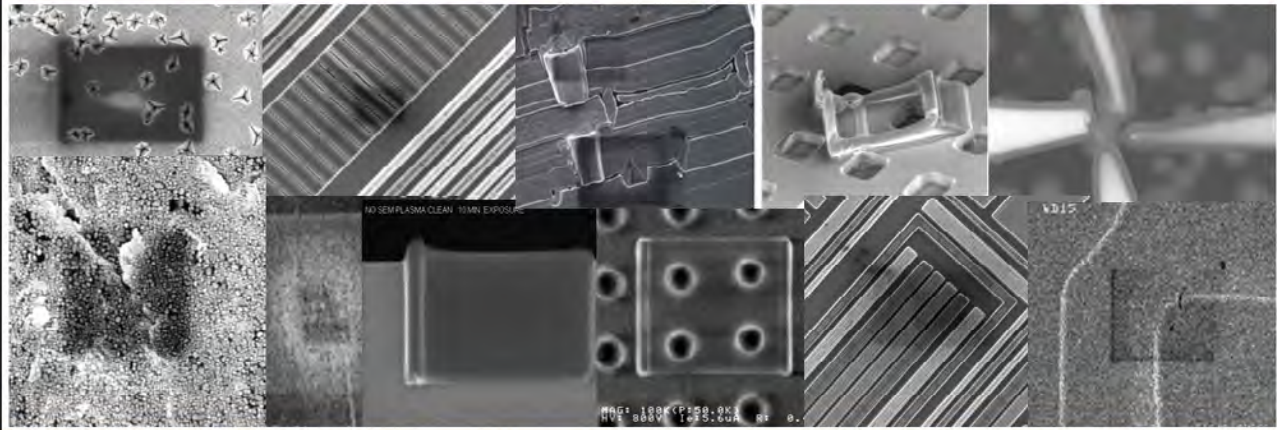


SPI Supplies Division of STRUCTURE PROBE, Inc.

P.O. Box 656 • West Chester, PA 19381-0656 USA
Phone: 1-610-436-5400 • 1-800-2424-SPI (USA and Canada) • Fax: 1-610-436-5755 • 2spi.com • E-mail: sales@2spi.com



Contamination Artifacts?




The Remedy: *Evactron*® *Cleaning*



 **XEI**
Scientific, Inc.

1755 East Bayshore Rd, Suite 17,
Redwood City, CA 94063
(650) 369-0133, FAX (650) 363-1659
email: sales@Evactron.com
www.EVACTRON.COM

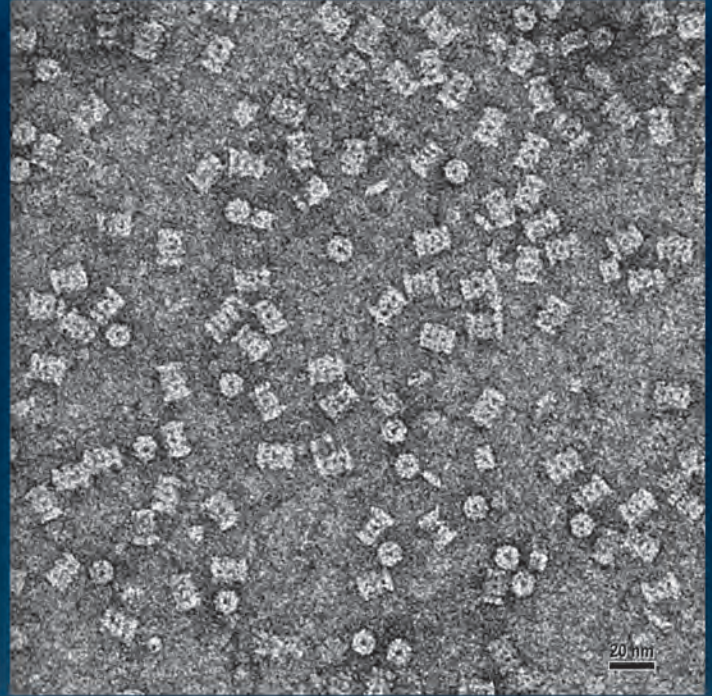
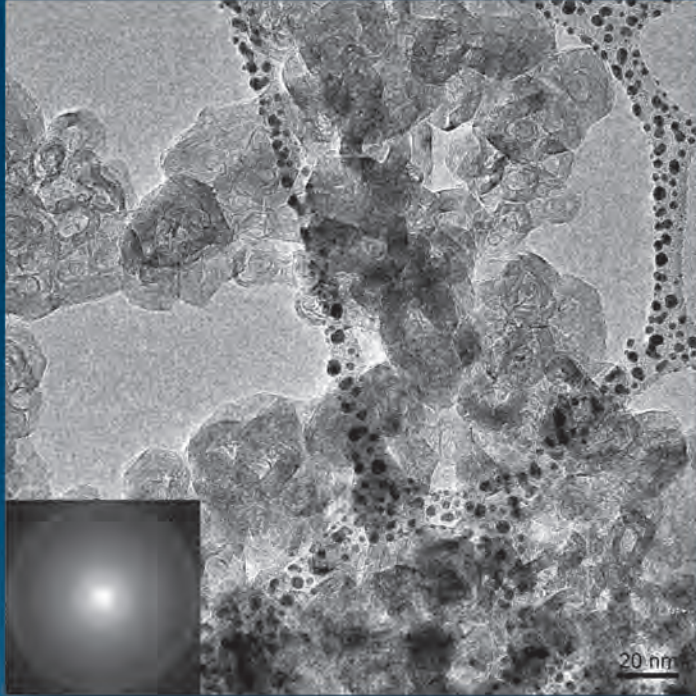
 *performs in carbon removal*

INDEX TO ADVERTISERS

Advanced Microscopy Techniques, AMT	A15, A24
Bruker	A12, A19
Denton Vacuum	A22
DiATOM	A14, A23
Electron Microscopy Sciences, EMS	A3, A17
Gatan	A9, Cover 3
JEOL	A11, A16, A21, Cover 4
Leica Microsystems	Cover 2, A20
Oregon Physics	A22
Oxford Instruments	A13
SPI Supplies	A10, A25
Ted Pella	A5, A18
TESCAN	A6
XEI Scientific	A26

K2

2nd Generation Direct Detection Camera



2nd generation direct detection technology reaches new heights:

- 4k x 4k, 5 μm pixels
- Full frame read-out at 400 frames per second
- Electron counting, 8k x 8k sub-pixel centroiding (Summit option)
- Unparalleled MTF, DQE
- Detector lifetime > 5 Ge⁻/pixel

Left image: Graphite fringes demonstrating resolution to Nyquist limit; imaged on Gatan K2Base™ camera at 14.5kx nominal TEM magnification and 200 kV.

Right image: 20S proteasome negatively stained by uranyl formate showing 1k x 1k region of interest; imaged on Gatan K2Base™ camera at 9.6kx nominal TEM magnification and 200 kV. Sample courtesy Dr. Yifan Cheng, University of California, San Francisco.



ANALYTICAL TEM
DIGITAL IMAGING
SPECIMEN PREPARATION
TEM SPECIMEN HOLDERS
SEM PRODUCTS
SOFTWARE
X-RAY MICROSCOPY

www.gatan.com

K2

Direct Detection Camera

In TouchScope™

*Get in touch with
this new class of SEM*



- SEM apps at your fingertips
- Compact, portable, affordable
- Integrated EDS analysis
- Low vacuum – SE and BSE imaging
- Wireless tablet operation
- Award-winning service and support

High Performance

Multi-Touch SEM



JSM-6010LA

JEOL

Another
Extreme Imaging
Solution

Global Solutions Provider for Advanced Technology
www.jeolusa.com • salesinfo@jeol.com
978-535-5900

See it at

<http://www.jeolusa.com/intouch>