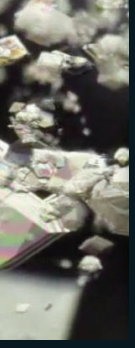
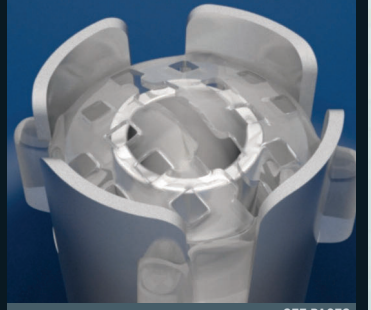
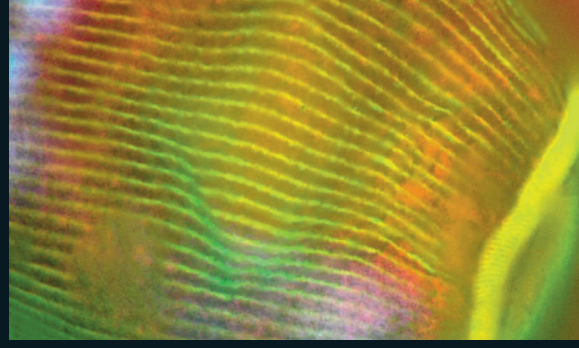




mPrep™ System SEE PAGES **8–11**

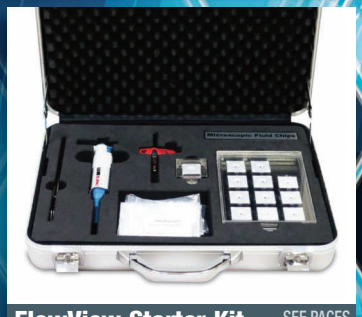


NEW PRODUCT FOCUS

the latest...the best...
the most advanced

Wet "Liquid" TEM Kit SEE PAGES **12–13**

Edge® Digital 3D Micro/Macroscopes SEE PAGES **18–21**



FlowView Starter Kit and Microscopic Fluid Chips SEE PAGES **14–19**

Electron Microscopy Sciences

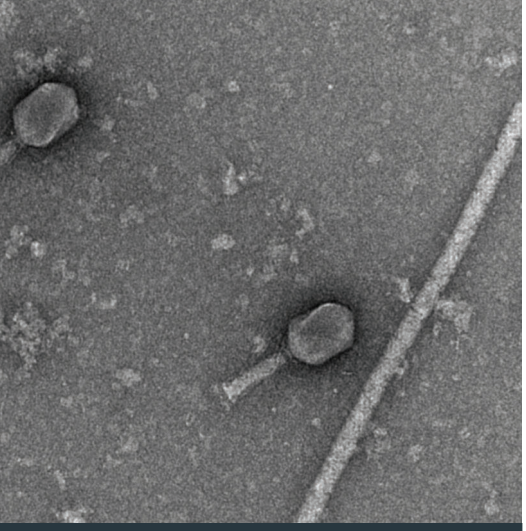
FlipScribe™ SEE PAGES **16–17**

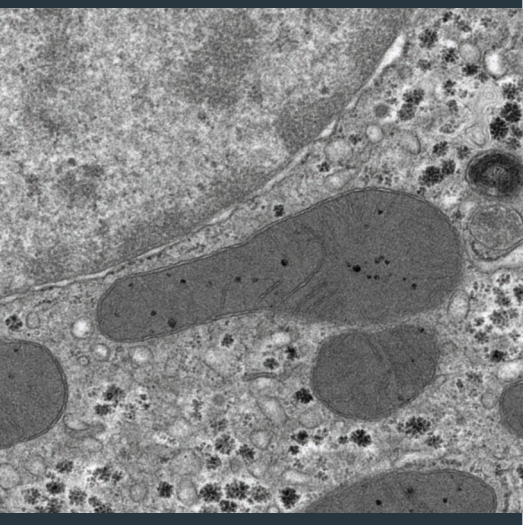
Mic-Fi Digital Wi-Fi Microscopes SEE PAGES **22–25**

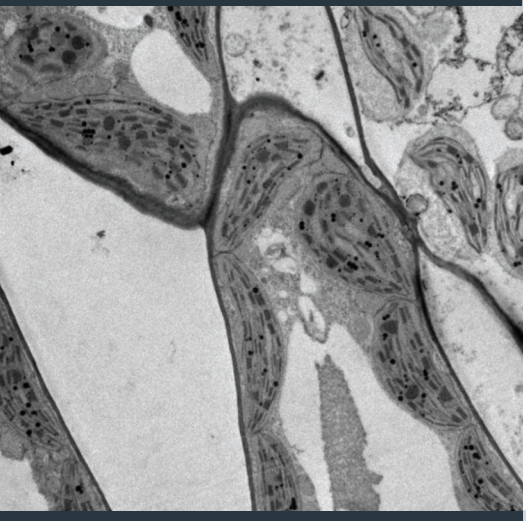
EMS-Core Sampling Tool SEE **Back Cover**

EMS GloQube™ SEE PAGES **26–27**

Evactron® Series Decontaminators and Cleaning Systems SEE PAGES **28–31**







A Substitute for Uranyl Acetate...

UranyLess EM Stain

EMS is proud to introduce UranyLess, a new contrast stain solution for TEM, for all of your negative staining applications. It is an amazing substitute for Uranyl Acetate with similar results.

After only a minute of contact, UranyLess' fast-acting, non-radioactive lanthanide mix is finished staining your sections or deposits (see protocols below). If needed, lead citrate is recommended to increase the contrast.

UranyLess's pH level is about 6,8 to 7. The 30ml airless bottle will stain approximately 1500 grids. The airless bottle increases the shelf life, eliminates CO_2 contamination, and produces less waste — the solution pumps out in perfect amounts without leaking or spilling. UranyLess is also available in a larger amount for use in automated staining equipment. When using UranyLess for automated staining, do not wash longer than 10 minutes or you run the risk of losing all contrast.

UranyLess has been tested on many biological tissue (animal and plant): intestine, skeletal and cardiac muscle, liver, kidney, adrenal gland, nerve, cell culture, plant tissue, and also on negative staining of bacteriophage, bacteria, and polymers. UranyLess is ideal because of its ability to stain any kind of material and results are reproducible.

30ml Airless Bottle

How does an airless bottle operate?

Its use is very simple; simply push on the head of the bottle to get a drop. When you release, the bottle back pump actuator lifts up. It prevents any air inlet in the bottle.

What is the advantage of an airless bottle?

It is a bottle in which air never enters. Some products, such as lead citrate, are atmospheric CO_2 sensitive. Thanks to this system, those products have a longer shelf life. It also allows the product to be deposited drop by drop, quickly, cleanly and in any position.

References

"Easier and Safer Biological Staining: High Contrast UranyLess Staining of TEM Grids"

1. Delta Microscopies, 22, B route de saint Ybars, La côte blanche, 31190, Mauressac, France
2. Université Toulouse, CMEAB Faculté Medecine, 118 route Narbonne, 31062, Toulouse, France
3. Microscopy Innovations LLC, 213 Air Park Rd, Suite 101, Marshfield, WI, 54449, USA

"C-Nap1 mutation affects centriole cohesion and is associated with a Seckel-like syndrome in cattle." Nature Communications. Published 23 Apr 2015. Sandrine Floriot, all.

200ml Bottle

Ordering Information

RT	**22409**	UranyLess EM Stain*	30 ml
RT	**22409-20**	UranyLess EM Stain	200 ml

* in airless bottle

Mouse Cardiac Muscle, Preparation of the sample using the following protocol:

- Classic - Fixing Glutaraldehyde, Osmium, Epon Ultrafine
- Cups, Double UranyLess Contrast and Lead Citrate

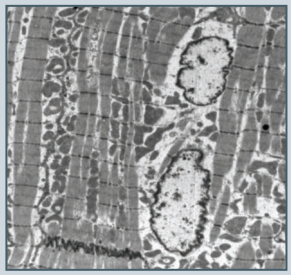


Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

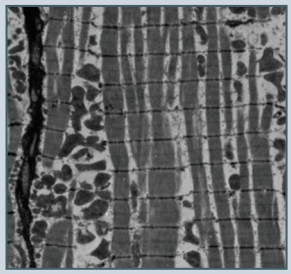


Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

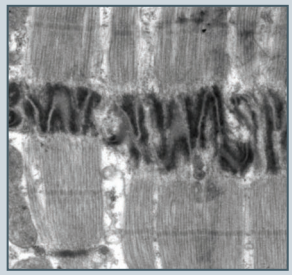


Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

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www.emsdiasum.com

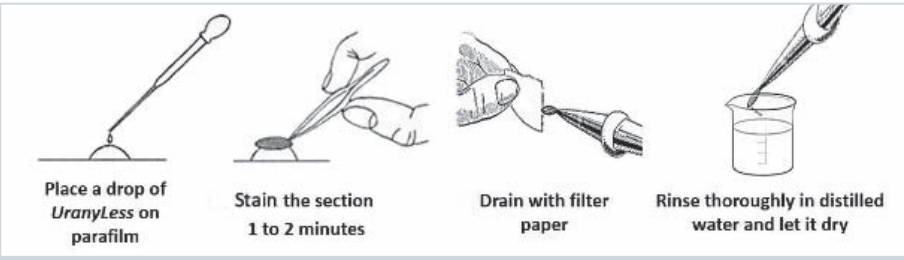
PROTOCOLS OF USE

Classic Contrast

This protocol is used for double staining with UranyLess/Lead citrate on ultrathin sections.
This protocol is adapted to biologic samples that have been fixed with glutaraldehyde, osmium, or ruthenium and embedded in an epoxy type resin (Epon, Araldite, Spurr) or acrylic type (LRWhite, HM20).

Staining Protocol:

- Place a drop of UranyLess on parafilm or any other hydrophobic slide.
- Place the grid on the UranyLess drop for 1 to 2 minutes.
- Blot the grid on a filter paper and then wash in distilled water.
- Let it dry.
- After drying, go to the lead citrate staining according to Reynolds method (1963).
- Place the grid on the lead citrate drop according to the Reynolds method, for 1 minute.
- Blot the grid on a filter paper before rinsing with distilled water.
- Let it dry.



Technical Tip:

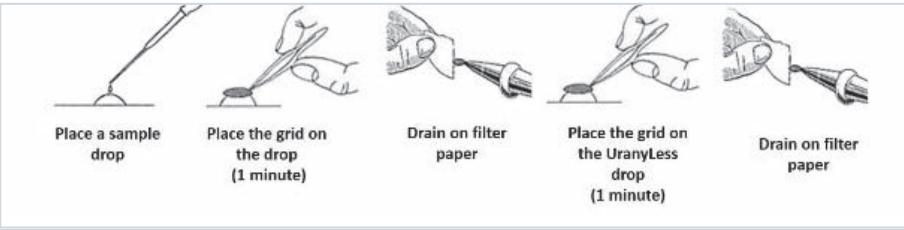
UranyLess is not air or light sensitive, unlike Uranyl Acetate.
After lead citrate, drain immediately in a freshly prepared distilled water bath or wash with 0.01N of NaOH solution.
If there is a precipitate in the solution, filter it prior to use.
If solution was refrigerated, allow solution to return to room temperature prior to use.
Do not keep lead citrate refrigerated.

Negative Staining

Negative staining is a very useful technique in electron microscopy. It allows characterization of isolated particles of morphology as bacteria, virus, protein, nanoparticles, liposomes, exosomes, etc.

Staining Protocol:

- On a piece of parafilm or any other hydrophobic carrier, place a drop of your solution (~10µl) and a UranyLess drop.
- Using our fine tweezers, place your sample drop on a formvar-carbon coated grid. for about 1 minute.
- Blot your grid using filter paper.
- Place your grid on the UranyLess solution for 1 minute.
- Blot, let it dry for 5 minutes and observe under the microscope.



Technical Tip:

If the staining is too intense, wash with water for 1 minute.

FREQUENTLY ASKED QUESTIONS...

What is UranyLess made from?
UranyLess is a solution ready for use, a mix of lanthanides (rare-earths).

How is UranyLess sold?
In an aqueous solution (water).

What is its shelf life?
One year.

What are the storage conditions for UranyLess?
Store it at room temperature away from direct sunlight.

Does it need to be diluted?
No, it is sold ready for use.

What is its pH?
UranyLess pH is 6.8–7.

How to stain with UranyLess?
Simply drop UranyLess on your grid, and wait a minute. Dry, then contrast with lead citrate according to Reynolds method.

Is it the same protocol for every kind of tissue (animal, plant, marine)?
Yes it is - a double stain of UranyLess plus Lead citrate.

Does it adjust to every kind of resin?
Yes, it operates with every kind of resin (Epon, Araldite, Spurr).

Can it be used on negative staining?
Yes, it can be used on negative staining.

Can it be used for bloc contrast?
Some tests are in progress.

Is it adapted to a cryo use?
No, because it is prepared in water. However, we are currently developing many formulations of UranyLess, including ethyl UranyLess and acetone UranyLess, the latter being the best-adapted to cryogenic use.

Is it efficient on marine material?
Yes.

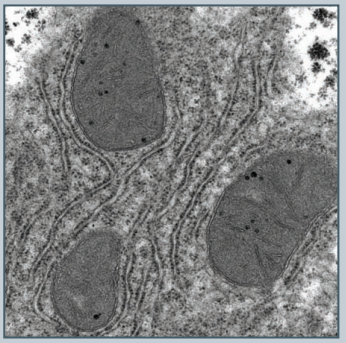
How is UranyLess packaged?
We sell UranyLess in an airless 30ml bottle and also in a brown 200ml bottle.

Can it be used with automated staining equipment?
Yes, the 200ml bottle is available for use with automated staining equipment. When using UranyLess for automated staining, do not wash longer than 10 minutes or you run the risk of losing all contrast.

Liver Mouse and Gerbil Sahara

Preparation of the sample using the following protocol:

- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess Lead - Citrate

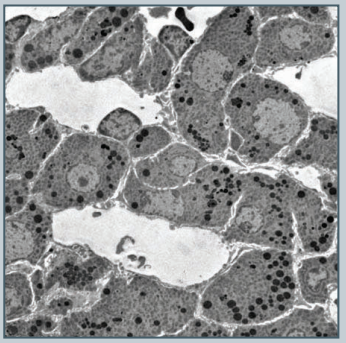


Hepatocyte - Perinuclear Region. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

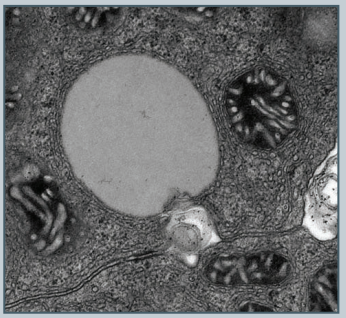
Adrenal Gland Gerbil Sahara

Preparation of the sample using the following protocol:

- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess lead -citrate



Adrenocortica. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

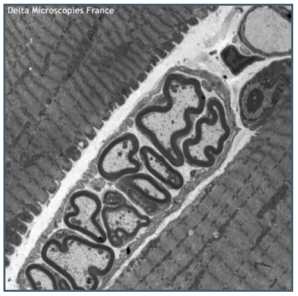


Adrenocortica. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

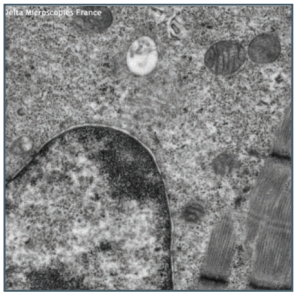
Muscle - Nerve - Mice

Preparation of the sample using the following protocol:

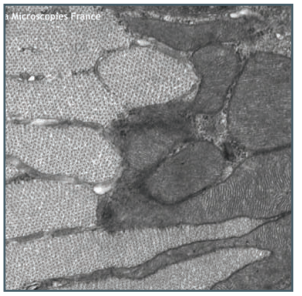
- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - UranyLess Contrast 1 minute followed lead Citrate 1 minute



Longitudinal Section of Mouse Skeletal Muscle - Nerve Cup (dense area myelin sheath). Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



Detailed View of Myocytes. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

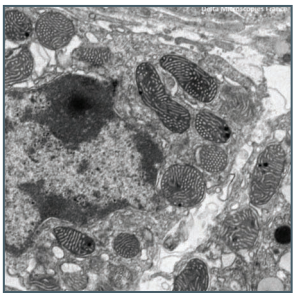


Cross Section of Muscle Fibers - Mitochondria. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

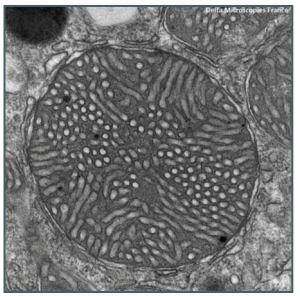
Mouse Ovarian Follicle,

Preparation of the sample using the following protocol:

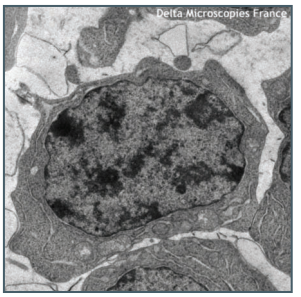
- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess Lead -Citrate



Theca Interna Mouse Ovarian Follicle. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



Mitochondria in Typical Finger Glove Steroid Synthesis in Cells (Internal Thèque Ovarian Follicle). Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

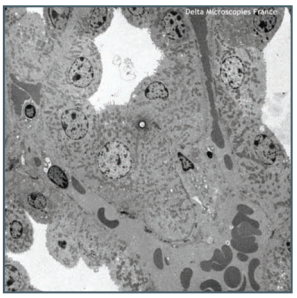


Follicular Cell of the Corona Radiata a Mouse Ovarian Follicle. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

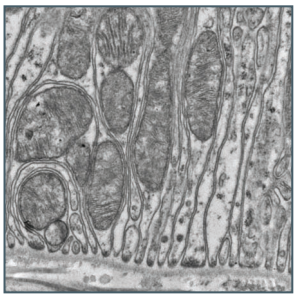
Mouse Kidney

Preparation of the sample using the following protocol:

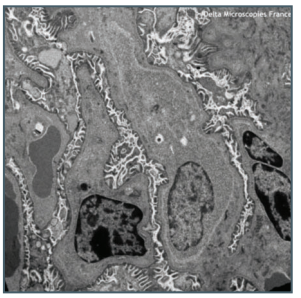
- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - UranyLess Contrast 1 minute followed lead Citrate 1 minute



Mouse Kidney. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



Basal Invaginations - Hémidesmosome - Basal Lamina: Increase the Exchange Surface - Kidney. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



Glomerular area - Podocytes - Stalks - Kidney. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

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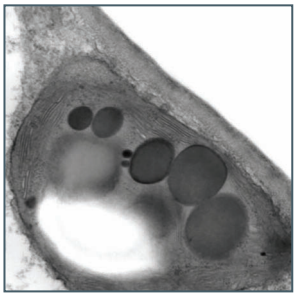
email: sgkcck@aol.com *or* stacie@ems-secure.com
www.emsdiasum.com

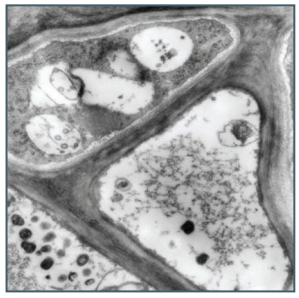
Plant Tissue

Preparation of the sample using the following protocol:

- Glutaraldehyde Fixation Classic - Osmium - Included in Epon
- Contrast the UranyLess monitoring Lead Citrate



Plant Leaf. Photo: Jeannine Lherminier (INRA - Dijon)

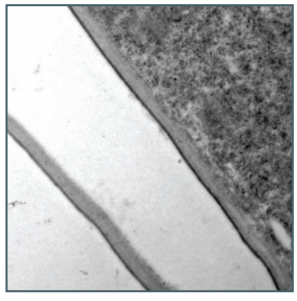


Plant Leaf. Photo: Jeannine Lherminier (INRA - Dijon)

Sacculina Crustaceans (Small Parasitic Crustacean)

Preparation of the sample using the following protocol:

- Classic Glutaraldehyde Fixation, Osmium, Epoxy Inclusion
- Fine Cups - Contrast to the Aqueous UranyLess to 60°C on a Hotplate without Lead Citrate Post Coloring



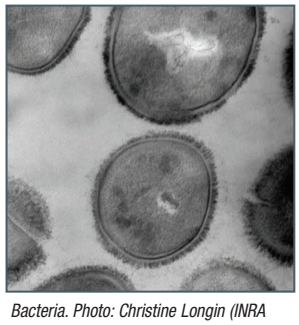
Sacculina (small parasitic crustacean) cuticle area. Photo: Djediat Chakib (Natural History Museum, Paris)

Cross-Sectional Bacteria

Preparation of the sample using the following protocol:

- Fixing Classic Glutaraldehyde, Osmium, EPON
- Cutting Ultrafine, Double Contrast UranyLess and Lead Citrate.

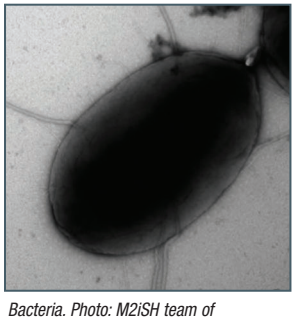
Bacteria. Photo: Christine Longin (INRA Jouy en Josas).



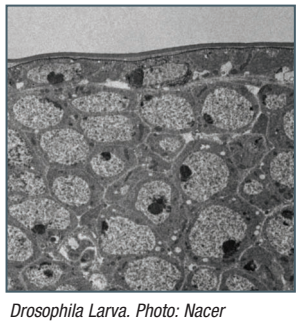
Bacteria. Photo: Christine Longin (INRA Jouy en Josas).

Bacteria E. Coli

Negative Staining for 2 Minutes UranyLess Bacteria Like E. Coli (Adherent and Invasive (ACSI) LF82) Which Have Pili and Flagella.



Bacteria. Photo: M2iSH team of Clermont Ferrand

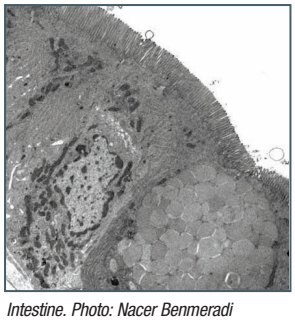


Drosophila Larva. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

Intestine

Preparation of the sample using the following protocol:

- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess Lead -Citrate



Intestine. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

Drosophila Larva

Preparation of the sample using the following protocol:

- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess lead -citrate

Reconstituted Epidermis

Preparation of the sample using the following protocol:

- Fixing Classic Glutaraldehyde, Osmium, Epon / Araldite
- Cutting Ultra-Thin, Double UranyLess Contrast and Lead Citrate

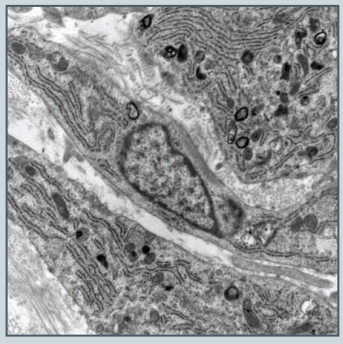


Photo: Audrey Houcine (CMEAB Toulouse)

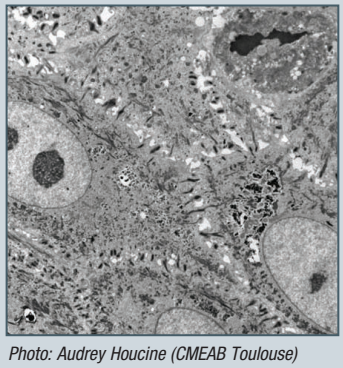


Photo: Audrey Houcine (CMEAB Toulouse)

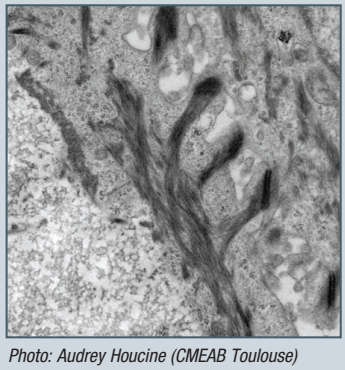


Photo: Audrey Houcine (CMEAB Toulouse)

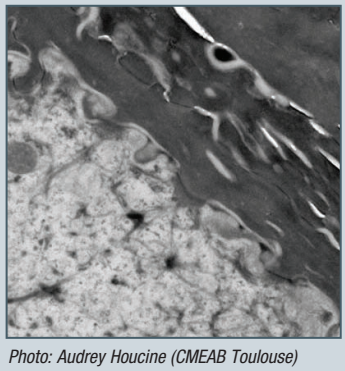
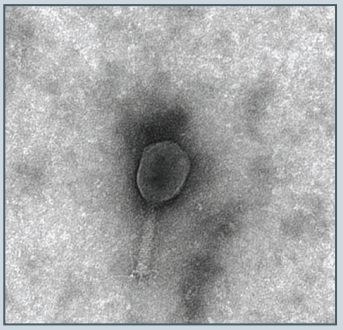


Photo: Audrey Houcine (CMEAB Toulouse)

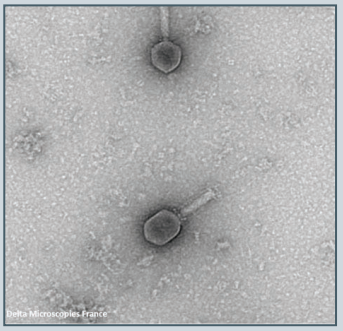
Phage T6

Preparation of the sample using the following protocol:

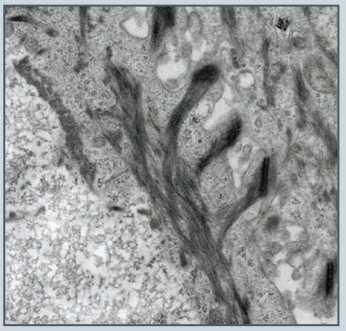
- Staggering Phage T6 on a G300-Cu grid Covered with a Carbon Formvar Film. Ionization 1 minute



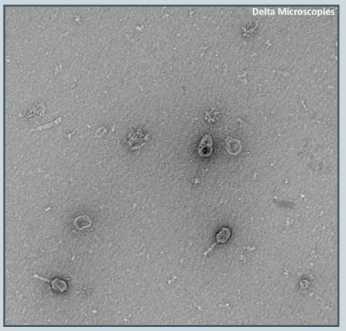
Phage. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



Phage. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



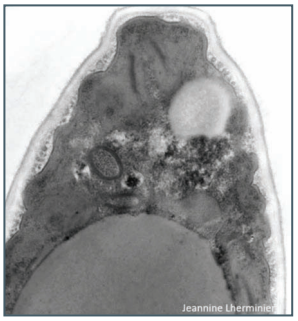
Phage. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



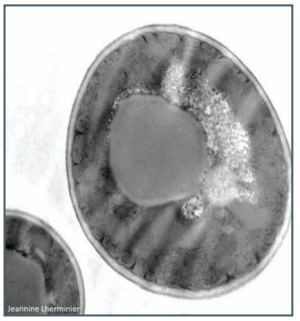
Phage. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

Yeasts, Preparation of the sample using the following protocol:

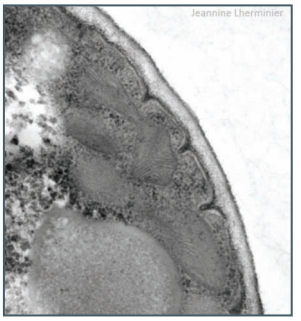
- Classic Fixation Glutaraldehyde - Osmium - Included in Epon
- Contrast the UranyLess monitoring Lead Citrate



Yeast. Photo: Jeannine Lherminier (INRA - Dijon).



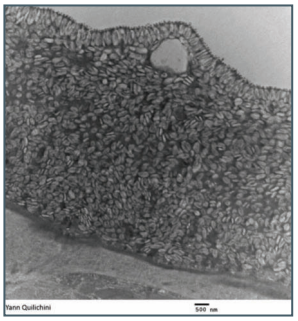
Yeast. Photo: Jeannine Lherminier (INRA - Dijon).



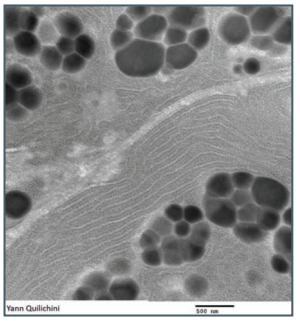
Yeast. Photo: Jeannine Lherminier (INRA - Dijon).

Trematodes, Preparation of the sample using the following protocol:

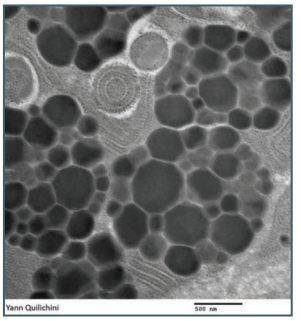
- Classic Glutaraldehyde Fixation, Osmium, Inclusion in Spurr Resin
- Contrast the UranyLess monitoring Lead Citrate



Trematodes. Photo: Yann Quilichini (Microscopy Platform of the University of Corsica - Corte)



Trematodes. Photo: Yann Quilichini (Microscopy Platform of the University of Corsica - Corte)

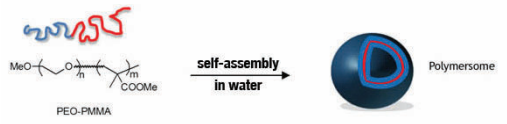


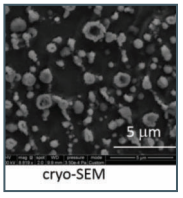
Trematodes. Photo: Yann Quilichini (Microscopy Platform of the University of Corsica - Corte)

Polymersomes

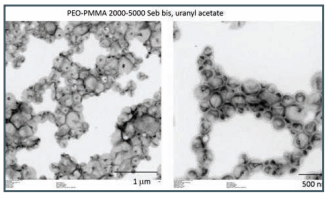
UranyLess was tested in comparison with uranyl acetate, which is at acidic pH 4 (seems to disrupt the organization of the molecular structure) in comparison also the comments by the technique Cryo SEM (scanning electron microscopy).

The chemical structure is organized as follows:

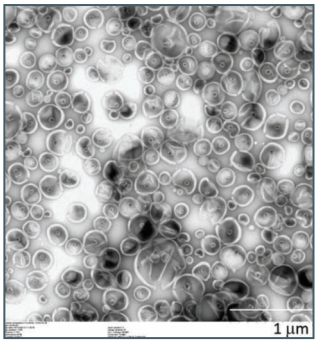




Polymersome, Observation Microscopy Scanning in Freeze Mode. Photo: The Toulouse Laboratory IMRCP, team Anne-Françoise Mingotaud.



Polymersomes, Negative Staining in Uranyl Acetate pH 4. Photo: The Toulouse Laboratory IMRCP, team Anne-Françoise Mingotaud.



Polymersomes, Negative Staining 1 mn in UranyLess in pH 7 Aqueous Solution. Photo: The Toulouse Laboratory IMRCP, team Anne-Françoise Mingotaud.

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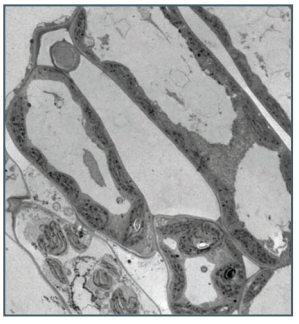
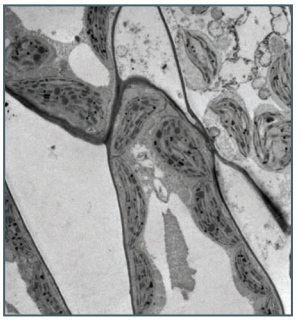
Parsley and Rosebush, Preparation of the sample using the following protocol:

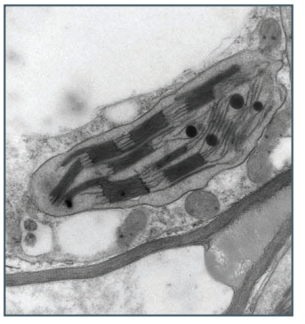
- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess lead -citrate



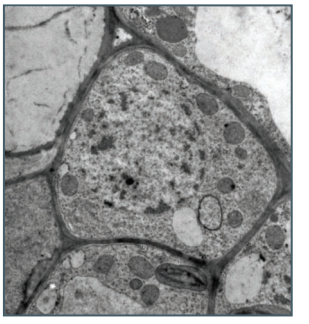
Parsley Leaf. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



Parsley Leaf. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



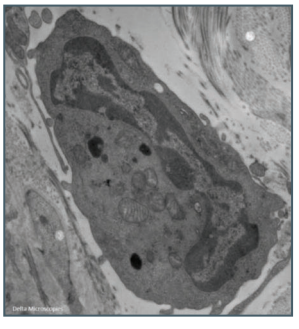
Rosebush. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



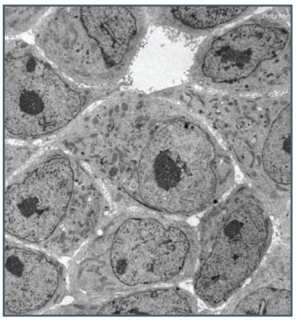
Rosebush Root. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)

Culture Cells, Preparation of the sample using the following protocol:

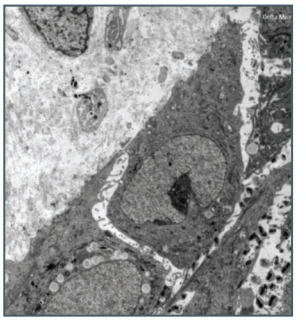
- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - Contrast UranyLess lead -citrate



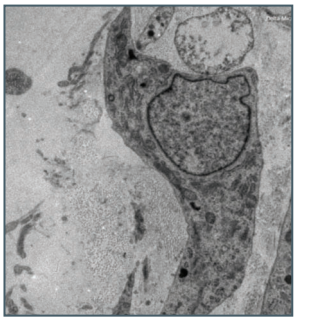
Culture Cell. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



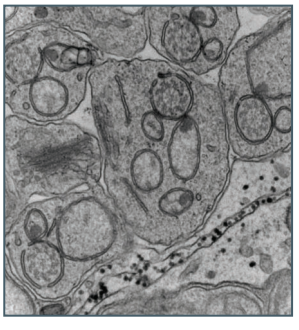
Culture Cell. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



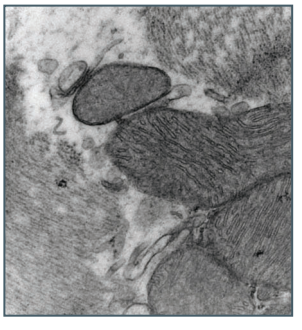
Culture Cell. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



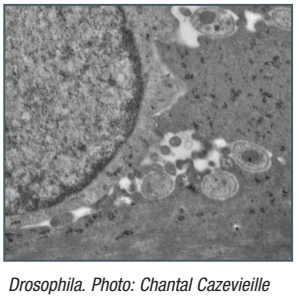
Culture Cell. Photo: Nacer Benmeradi (R & D - DeltaMicroscopies-France)



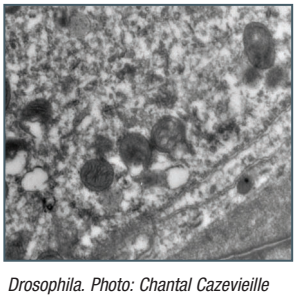
Spermatides Drosophile. Photo: Chantal Cazevieille Montpellier



Heart Headset. Photo: Chantal Cazevieille CRIC / IURC la'INSERM Montpellier (R & D - DeltaMicroscopies-France)



Drosophila. Photo: Chantal Cazevieille CRIC / IURC la'INSERM Montpellier

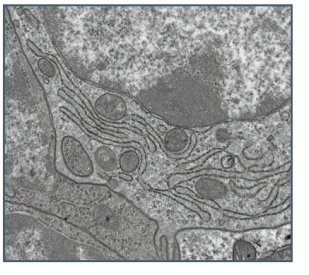


Drosophila. Photo: Chantal Cazevieille CRIC / IURC la'INSERM Montpellier

PLC Contrast Leica EM Stain

Preparation of the sample using the following protocol:

- Classic-Glutaraldehyde Fixation PFA, Osmium, Epon
- Ultrafine Cup - contrast Uranyless Lead -Citrate



Drosophila. Photo: Chantal Cazevieille CRIC / IURC la'INSERM Montpellier

Chantal Cazevieille CRIC / IURC INSERM Montpellier tested aqueous UranyLess in the Leica brand grid contrast controller on different tissues, Drosophila heart atrium, retina, cochlea and ileum (Gut). The tissues were fixed according to the standard protocol 2.5% Glutaraldehyde in PHEM buffer, the post fixation in 0.5% osmium in 0.8% potassium ferrocyanide in RT for 2 hours. The sections are collected on single-hole or 200 mesh grids.

The treatment of the grids is UranyLess 7mn lead citrate followed 7 minutes.

We present here some images made by Hitachi transmission electron microscope with a digital camera AMT.

You will notice that the combined action of potassium ferrocyanide and UranyLess reveal a marked way the cyto-membranes in the ileum.

consistent sample preparation with almost no direct handling of specimens and grids

Overview

The mPrep™ System saves you effort while protecting and keeping track of valuable samples. The system features two types of purpose-built, microliter-volume capsules – one for specimens, the other for grids. Capsules attach to standard pipettors, which are used to conveniently deliver reagents in measured amounts.

Users get consistent sample preparation with almost no direct handling of specimens and grids. Once the tissue or grid is in its own, labeled capsule, you don't have to touch it again during processing. It is safe, easy-to-handle and clearly labeled. The small, enclosed capsule, reduces reagent consumption. The system adapts to any protocol for biospecimen preparation, grid staining or immuno-labeling. Multi-channel pipettors enable users to increase throughput, with virtually no extra effort. Read more to see how these cleverly designed capsules work!

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mPrep™ System for Specimen Preparation and Grid Staining

mPrep/s™ Specimen Processing Capsules

mPrep/s™ capsules allow users to fix, dehydrate and embed specimens in a single vessel. They can be used in two ways. The first method is to entrap specimens in the bottom of the capsule using the removable, adjustable screen with the hand-held Insertion Tool (85010-03). The second method is to flex the screen open using the mPrep/s™ Workstation* (85010-06). With the screen opened, the user places a specimen in the screen and orients it to the desired position within the capsule. Once the screen closes on the specimen, it is held in place throughout fixation, embedding, and sectioning. No additional embedding molds are required, and the capsule itself easily fits in the microtome chuck. This capsule is highly recommended for transmission and scanning electron microscopy, but can also be used for any sample preparation.

mPrep/s™ capsules are available in storage boxes or in bulk. The hand-held Insertion Tool (85010-03), the Workstation* (85010-06), and additional recommended accessories for use with the mPrep/s™ capsule are located below.

* The Workstation is required to make use of the orientation feature of the mPrep/s™ screen.

Capsule

Screen

Insertion Tool

Cat. No.	Description	Qty.
85010-01	mPrep/s™ Capsules in Storage Box: Capsules, 12 Screens, 8 Blank Label Sets	box
85010-02	mPrep/s™ Capsules (bulk)	96/pk
85010-03	mPrep/s™ Insertion Tool	each

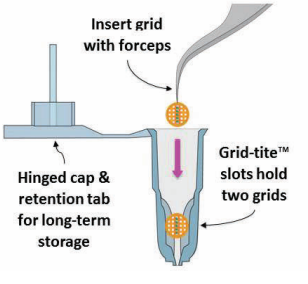
mPrep/g™ Grid Processing Capsules

Each capsule can hold one or two TEM grids securely for staining, immuno-labeling and labeled storage. Grids are protected from loss, misidentification, and damage. Grid-tite™ slots keep grids safe even if an open capsule is dropped.

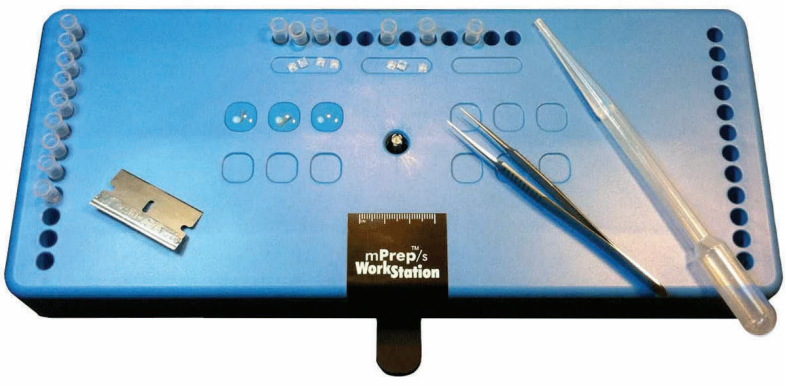
Grids require handling only twice: when inserted into capsules and when placed in the TEM.

Using a multi-channel pipettor, processing up to 24 grids simultaneously takes no more effort than a single grid. Reagent consumption is as little as 20µl per grid. The chance of grid damage or loss is greatly reduced using these capsules. See mPrep/g™ Pipettor Kits (85010-07 to 85010-10) and additional accessories below.

Cat. No.	Description	Qty.
85010-04	mPrep/g™ Capsules in Storage Box, 16 Capsules, 16 Blank Label Sets	box
85010-05	mPrep/g™ Capsules (bulk)	96/pk



mPrep/s™ WorkStation for TEM and SEM



Everything you need to work efficiently while preparing your samples using mPrep/s™ capsules is easily accomplished with the mPrep/s™ WorkStation. Simply load the capsule onto the built-in insertion tool at the center of the workstation, detach the screen from the capsule, use the lever to open the screen and insert the specimen. Then release the lever and re-attach the capsule. Once loaded, the sample requires no additional handling – even for TEM embedding or SEM mounting.

The mPrep/s™ Workstation's polyethylene surface minimizes dulling of dissection tools and is fully immersible for for easy cleaning between uses. Molded into the surface are 12 dissection wells to organize your specimens and keep them wet if desired. At the back, 12 capsule wells and 3 screen holders conveniently hold these prior to use. On either side of the workstation, a total of 24 capsule wells can hold loaded capsules and keep them wet while loading into the channels of the pipettor. Single and multichannel pipettor kits are sold separately. Additional recommended accessories for use with the mPrep/s™ Workstation are located on the following page.

Features

- **Specimens may be oriented using several methods**
- **Streamlines specimen processing from dissection to reagent processing**
- **Once loaded in capsules, specimens are not touched again – even for TEM embedding or SEM mounting**
- **Dissect and load specimens wetted by buffers or fixatives**
- **Directly load capsules onto pipettor from Workstation**

Applications

- **Capsule-based Processing of Biological Tissue for TEM**
- **Biological tissues – fix and critical point dry (CPD)**
- **Bio tissue cryo-facing**
- **Polymer cross-section preparations**

Cat. No.	Description	Qty.
85010-06	mPrep/s™ Workstation	each

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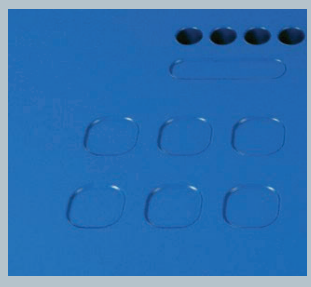
Using the mPrep/s™ WorkStation

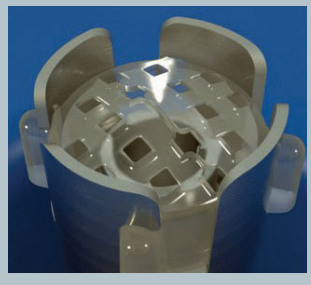
Prepare the specimen

- Trim and dissect on Workstation surface
- Use shallow wells to keep specimens organized
- Add water or fixative to wells during dissection



Load screen (and unoriented specimens)

- Insert mPrep/s™ screen into Workstation insertion tool
- Engage screen tabs into insertion tool flanges



Orient specimen – Back Pinch Method

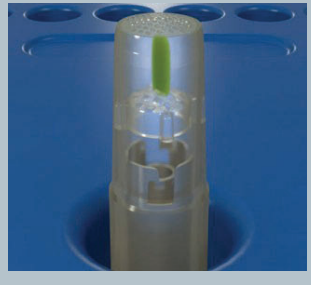
- Press Workstation lever to open screen
- Place back end of specimen into screen opening
- Release lever to pinch specimen

Encapsulate specimen

- Slide capsule down to hold specimen in place
- For Back Pinch Orientation method leave space above specimen

Remove capsule from Workstation

- Rotate capsule counter-clockwise to disengage screen from Workstation insertion tool
- Lift capsule off Workstation



Set aside encapsulated specimen

- Place capsule into a Workstation well
- Add fluids to wells to keep specimens wet
- Load capsules directly onto pipettor for reagent processing

mPrep™ Pipettor Kits

Choose from either single- or multi-channel pipettor kits built around mPrep/s™ or mPrep/g™ capsules.

Single-channel kit includes: single channel 200 µl pipettor, one mPrep™ capsule pack of your choice and one pack of 96 pipette tips, size 10µl.

Eight-channel kit includes: eight-channel 200 µl pipettor, one mPrep™ capsule pack of your choice and one pack of 96 pipette tips, size 10µl.

Cat. No.	Description	Qty.
85010-07	mPrep/g™ Pipettor Kit, Single Channel	kit
85010-08	mPrep/g™ Pipettor Kit, Multichannel	kit
85010-09	mPrep/s™ Pipettor Kit, Single Channel	kit
85010-10	mPrep/s™ Pipettor Kit, Multichannel	kit

mPrep™ System Accessories

(mPrep/s™ and mPrep/g™ compatible)

mPrep Filter-Couplers

Filter couplers prevent the introduction of damaging reagents into pipettors.
They also improve the fit of mPrep/g™ capsules on some pipettors.
Pack includes
16 filter couplers and a capsule storage box.

Available in two pore sizes:

1. Standard mPrep/f30™: nominal 30 µm pore size filter appropriate for most applications.
2. Extreme mPrep/f13™: nominal 13 µm pore size filter for use with biohazards and very aggressive reagents.

85010-10, -11

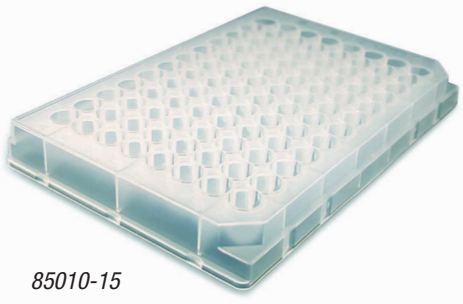
mPrep™ Tousimis® Capsule Holder

85010-13

Holds up to 6 mPrep/s™ or mPrep/g™ capsules in Tousimis® CPD apparatus

Microwell Plates

Chemically resistant 96-well plates, 10 per pack, polypropylene



85010-15

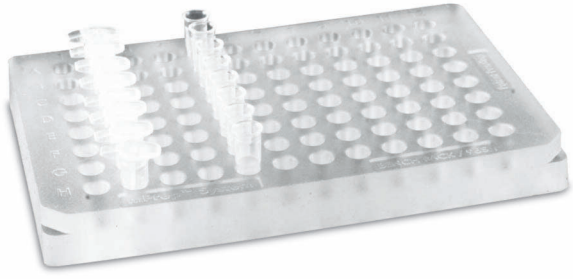
Reagent Reservoirs

Chemically resistant 15ml reservoirs, 50 per pack, HDPE

85010-14

mPrep™/Bench

96-well silicone rack provides tight seal to capsule bottoms during incubations or transfer of fluid-filled capsules to ovens and incubators. Autoclavable.



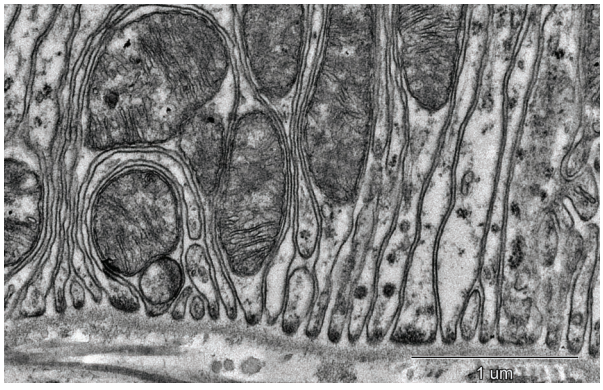
Cat. No.	Description	Qty.
85010-11	mPrep/f30™ Standard Filter-Couplers	16/pk
85010-12	mPrep/f13™ Extreme Filter-Couplers	16/pk
85010-13	Tousimis® Capsule Holder	each
85010-14	Reagent Reservoirs	50/pk
85010-15	Microwell Plates	10/pk
85010-16	mPrep™ Bench	each

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 *or* stacie@ems-secure.com
www.emsdiasum.com

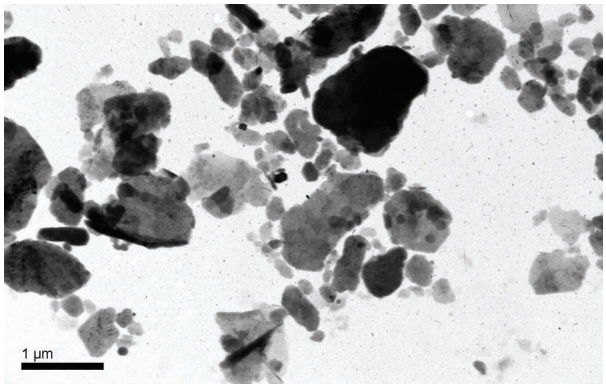
APPLICATIONS:

Transmission Electron Microscopy (TEM)

The mPrep System™ streamlines Transmission Electron Microscopy (TEM) sample preparation using a capsule based approach. Use mPrep/s capsules to fix, orient, embed, and section specimens. Use mPrep/g capsules to stain or immuno-label TEM grids. The mPrep System™ efficiently produces quality results from every sample. Imagine this in your lab...

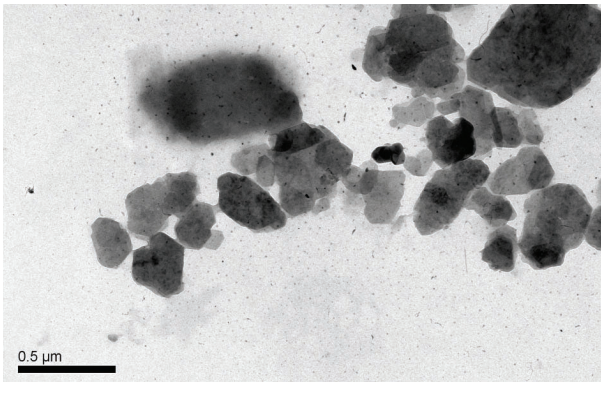


- **As few as two human touches from microtome to microscope – reduces damage and loss**
- **Grids and capsules labeled for easy tracking from start to storage**
- **Capsules attach to common lab pipettors for controlled reagent timing and minimal reagent consumption**
- **Parallel processing**
  - ***Stain from one to dozens of grids simultaneously using multi-channel pipettors***
  - ***Identical reagent timing***
  - ***Reduced tedium and labor costs***



APPLICATIONS:
Materials Science

The mPrep System™ streamlines materials sample preparation. Use mPrep/s capsules to prepare specimens for TEM, SEM, and other analytical instruments that require sample sectioning. Use mPrep/g capsules to prepare specimens on TEM grids. mPrep™ System benefits include:



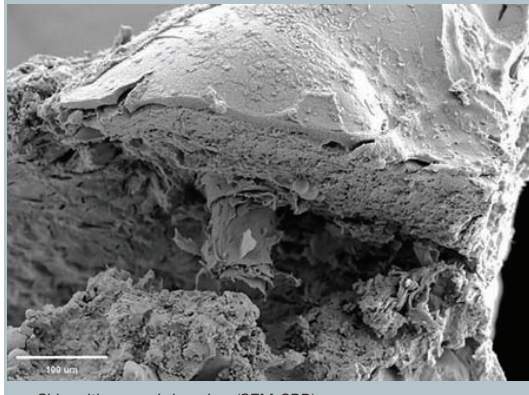
- **Embed and cross-section polymers, soft material, films and fibers**
- **Entrap small particles for easy handling**
- **Orient films and fibers for SEM preparation and imaging**
- **Prepare nanoparticles on grids**

APPLICATIONS:

Scanning Electron Microscopy (SEM)

The mPrep System™ streamlines Scanning Electron Microscopy (SEM) sample preparation. Use mPrep/s™ capsules to efficiently fix, orient, hold and mount SEM specimens. Use mPrep/g™ capsules to prepare specimens on TEM grids. mPrep System™ benefits include:

- Simultaneous reagent processing
- Consistent quality
- Controlled and reduced reagent consumption
- Increased reproducibility
- Reduced errors and accidents due to limited sample touches
- Easily traceable samples and grids



Skin with wound dressing (SEM CPD)

Cactus (SEM Cryo-faced)

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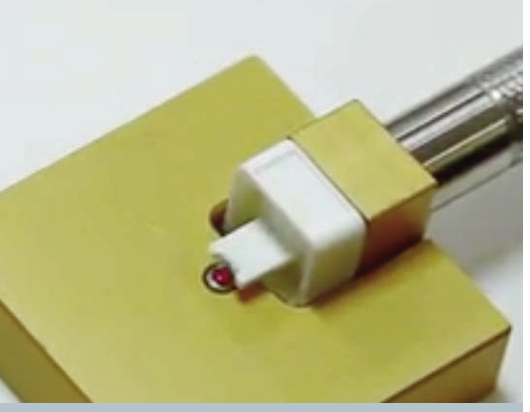
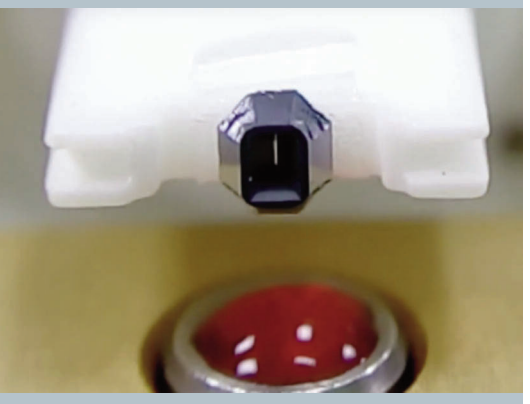
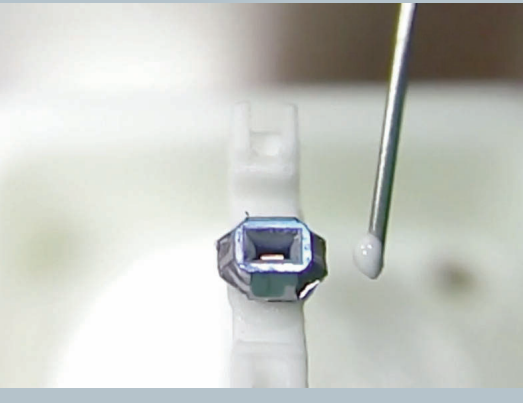
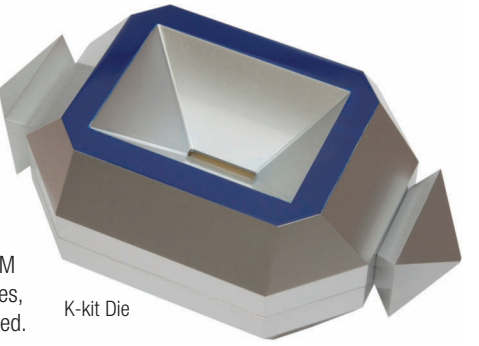






Wet "Liquid" TEM Kit

an innovative enclosed
specimen holder for Liquid TEM

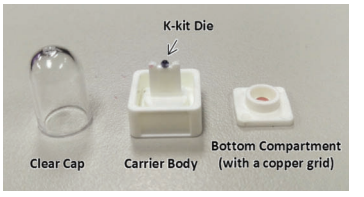


K-kit Die

Overview

K-kits are sample holders designed to facilitate convenient TEM observation of liquid samples, allowing nanoobjects, aggregates, and agglomerates (NOAAs) in liquid samples to be characterized.

With vacuum compatible sealing of liquids in electron-transmitting thickness, K-kits are micro reaction chambers for countless experiments in materials, chemical, and biological research.

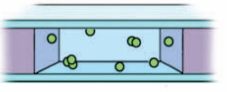


Features

- **Applicable for most TEM holder brands**
- **Strong structural reliability under vacuum**
- **Sealing glue compatible to many solvents**

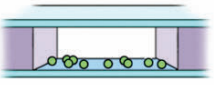
Applications

Wet

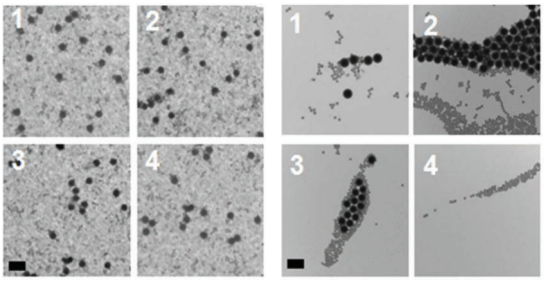


The loaded liquid sample is sealed and imaged using TEM in the native liquid environment.

Thin Layer



A patented liquid drying protocol preserves the original morphology and physical state of nanomaterials with improved imaging resolution.



Images shown: NIST traceable polystyrene beads. Scale Bar 500nm.

Physicochemical Parameters	K-kit	Conventional
Composition	✓	✓
Size	✓	✓
Shape	✓	✓
Size Distribution	✓	Δ
Aggregation and Agglomeration in liquid	✓	X
Particle Concentration	✓	X
Liquid TEM Observation	✓	X

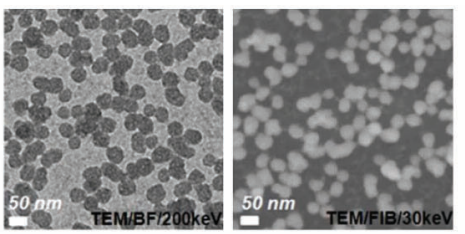
✓ = Good Δ = Case dependent X = Not Available

The table below shows the test results of K-kit sealing epoxy soaked in chemical solvents for 24 hours and then examined using FTIR, Fourier Transform Infrared Spectroscopy, (if dissolved) and visual observation (if dispersed).

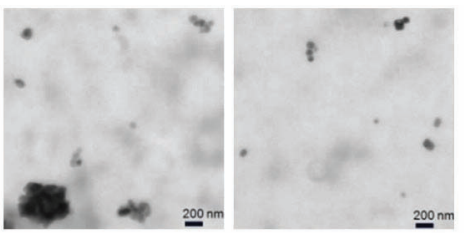
	Acetone	DCM	DMSO	95% Ethanol	0.1 N HCl	0.1 N KOH
Dissolution (FTIR)	X	X	✓	✓	✓	✓
Dispersion (visual)	X	X	X	✓	✓	✓
	Hexane	**IPA**	**Methanol**	**PEG400**	**THF**	**Di-H_2O**
Dissolution (FTIR)	✓	✓	✓	✓	X	✓
Dispersion (visual)	✓	✓	X	✓	X	✓

✓ = Not detected (OK) X = Detected (use with care)

Sio_2 Nanoparticles in Polishing Slurry



$CaCO_2$ Nanoparticle Additives in Milk



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Components

- **Tools are optional available in a Tool Set or ordered individually. The glues are also available.**
- **Figures are for illustration purposes. The tools you order may be different in color and/or from minor design changes.**

Gluing Stand

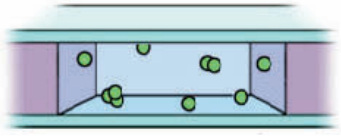
Sample-Loading Stage

Channel Opener

Copper Grid

K-kits

Two gap heights (H) available: 0.2µm or 2µm. Two package options: 4 or 6 K-kits per pack. Additional gap heights and pack sizes available upon request.



K-kit Tool Box

The K-kit Tool box is available in red or silver. It houses a full tool set, including K-kit holder, Sample Loading Stage, Needle Pen, Gluing Stand, Channel Opener, Sealing Glue, Mounting Glue, Glass Slides, 6/pk of K-kits, Shipping Box (empty), and some replacement parts.

K-kit Holder

The K-kit Holder consists of an anodized aluminum header and a stainless steel handle. The K-kit carrier fits on the header (after removing the bottom compartment). When the notch on the side of the header fits over the horizontal bar on the Loading Stage (see below), the K-kit on the carrier attached on the header will be just above the liquid sample.

Sample-Loading Stage

The Loading Stage consists of an anodized aluminum body. It has a horizontal bar in a recess on the side and a hole in the middle to house the Liquid Stage, which is a removable stainless steel rod. The removable design is for easy cleaning. The horizontal bar defines the rotational axis for the K-kit Holder, which has a notch on the header to fit on the horizontal bar.

Needle Pen

The Needle Pen is designed to facilitate the K-kit gluing operation. It has a thin needle 3.0 mm long and 0.27 mm in diameter. The thin needle makes it convenient to pick just enough glue (of the order of 0.1µl(x)) for sealing the channel openings and (around 1µl(x)) for mounting the copper grid. The needle is made of stainless steel. It is strong, yet slightly flexible, suitable for the job.

Notes:

It is important to keep the needle free of residue glue. Please wipe the needle clean right after each use. It will be practically impossible to clean the needle once residue glue on it cures.

The needle is held in place in the pen by a set screw on the side of the pen. A replacement needle and a small Allen key are provided with each Needle Pen. The needle is sharp. Please handle with care.

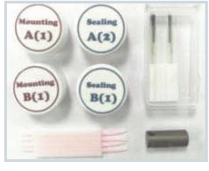
Gluing Stand

The Gluing Stand has a stainless steel base and an anodized aluminum header, which is much like the header on the K-kit holder, without the notch on the side. The Gluing Stand keeps the K-kit carrier in place for gluing work.

Accessory Box

The Accessory Box contains sealing and mounting glues, four plastic sticks, and spare parts, including a spare needle, an Allen key for the Needle Pen, a Channel Opener, and two Liquid Stages. (The label can be redesigned.)

Starter Box



The Starter Box contains all of the essentials for K-kit loading. It consists of glues, a beaker, four stirring sticks, and two stainless steel thin needles.

Channel Opener

The Channel Opener is used to remove the channel tips, while the K-kit stays on the carrier. It's made of anodized aluminum with a cut-off slot design at one end.

Copper Grid

Ten pieces of Copper Grid per pack.

Slide-Glass Pack

Six glass slides per pack.

K-kit Holder

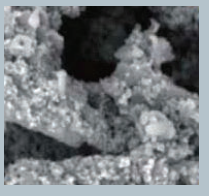
Needle Pen

Ordering Information

Cat. No.	Description	Qty.
K7260-402	K-kit 0.2	4/pk
K7260-420	K-kit 2.0	4/pk
K7260-602	K-kit 0.2	6/pk
K7260-620	K-kit 2.0	6/pk
K7261-R	K-kit Tool Box, Red, includes full tool set	each
K7261-S	K-kit Tool Box, Silver, includes full tool set	each
Accessories		
K7263	K-kit Holder	each
K7264	Sample Loading Stage	each
K7265	Needle Pen	each
K7266	Gluing Stand	each
K7267	Accessory Box	each
K7268	Starter Box	each
K7269	Channel Opener	each
K7270	Copper Grid	10/pk
K7271	Slide-Glass Pack	6/pk

Advantages of Microscopic Fluid Chips (MFC)

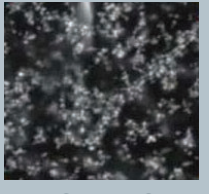
- Placed with the silicon wafer & biochip substrate for in-situ observation
- Extended to automatic sampling and high-precision temperature control
- As a shuttle to an optical microscope/fluorescence microscope for in-situ observation
- Intuitive sample injection (encapsulated within a minute)



DRIED

Using MFC

WET



"In Situ" Observation

- Size
- Size Distribution
- Particle Aggregation
- Particle Dispersion
- Concentration
- Shape
- Composition

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world-leading innovative liquid sample inspection with SEM

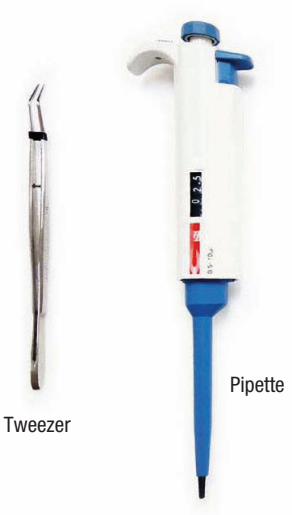
"Liquid" Scanning EM Kit

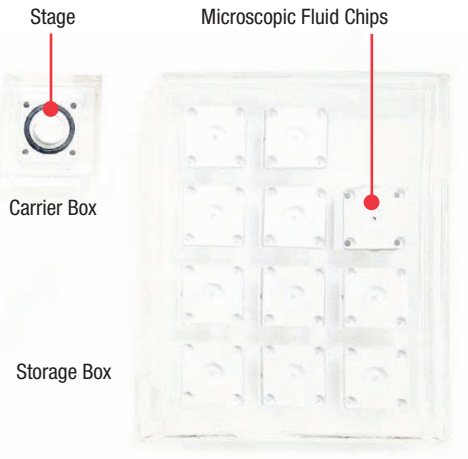
FlowView Starter Kit and Microscopic Fluid Chips

These economic and easy-to-use starter kits include stage, accessories, and 24 Microscopic Fluid Chips (Standard, Semi, or Bio). The chips are compatible with SEM for most major brands. The Microscopic Fluid Chips are available separately and are metal, so can be recycled.

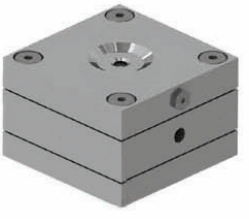
The kit contains:

- Tweezer
- Pipette
- Torque Wrench
- Carrier Box
- Storage Box
- 24 Microscopic Fluid Chips



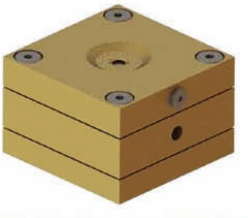


Microscopic Fluid Chips



MFC Standard

Most sample droplets (paint, mixing slurry, particles in oil)



MFC Semi

CMP slurry particles, Wet etching, Photoresist developing, Electroplating

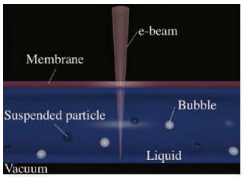
MFC Bio

Cell morphology, Bio-fluidic microchips, Polystyrene

Ordering Information

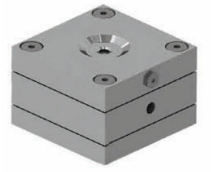
Cat. No.	Description	Qty.
FV-102	FlowView Starter Kit — Standard	each
FV-103	FlowView Starter Kit — Semi	each
FV-104	FlowView Starter Kit — Bio	each
FV-105	Microscopic Fluid Chips — Standard	24/pk
FV-106	Microscopic Fluid Chips — Semi	24/pk
FV-107	Microscopic Fluid Chips — Bio	24/pk

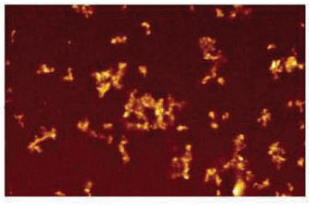
APPLICATIONS:



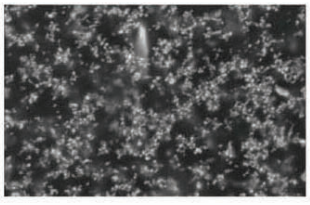
MFC Standard Application

Size, aggregation, shape and composition with in-situ liquid sample inspection

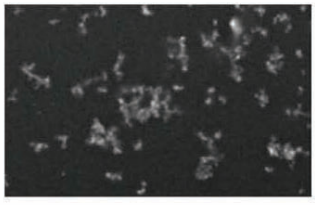




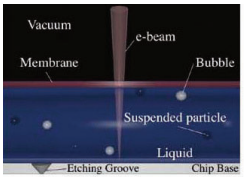
Energy & Environment Related Liquid Material
Detect & analyze the electrolyte particle distribution of liquid samples in real size



Paint & Coating Material
Analysis of the actual particle distribution in the paint or coating suspension

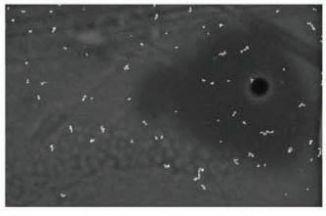


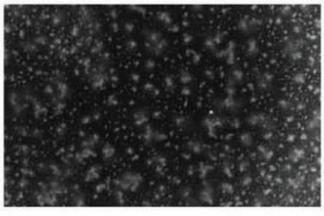
Mixing Slurry Material
The analysis of the raw material in liquid phase, solid-type analysis of the slurry can be observed in actual size

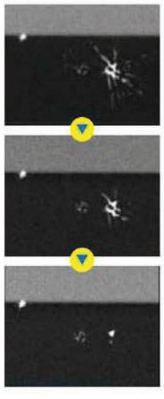


MFC Semi Application

Observe the in-situ biochip-based reaction in liquid state



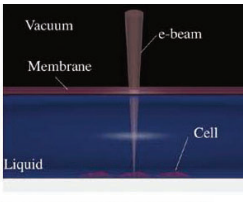




Solar Material
- Precipitation Analysis
- Material of dynamic observation

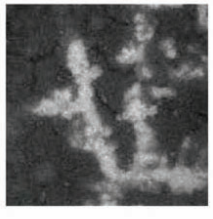
Wet Etching and Photoresist Developing Process
- Bubble liquid/suspension analysis
- Photoresist/width/monitoring of the structure and dynamics
- Analysis of the liquid phase process while the substrate surface deposits

Electroplating
- Plating bath analysis of suspended particles
- Analysis of the substrate surface precipitation
- Dynamic observation of metal deposition

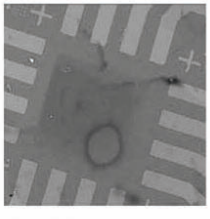


MFC Bio Application

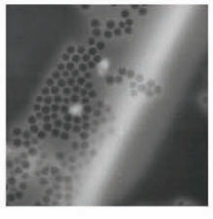
Observe the in-situ silicon wafer-based reaction in liquid state



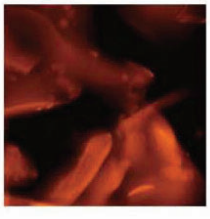
Cell Morphology
- Cell morphology observation
- The test substrate microorganisms/ tissue engineering
- Detection of cell suspension



Bio-chips
- Liquid bio-chips observation
- Dynamic recording of chip operation
- Analysis of surface modification of the fixed substance

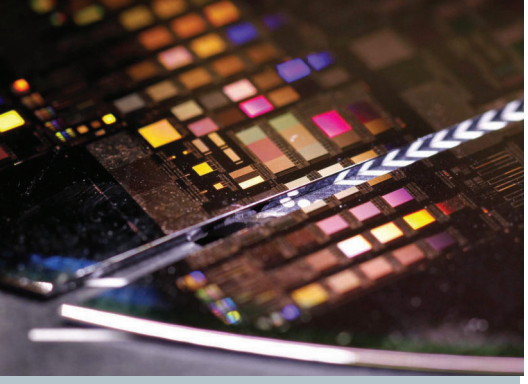


Polystyrene
- Polystyrene surface imaging
- Polystyrene size analysis
- Drug solubility analysis



Shuttle Function
- Observed sample can be transferred to an optical or fluorescence microscope
- The dynamics of the liquid and the surface morphology of fluorescent nanoparticles can be analyzed

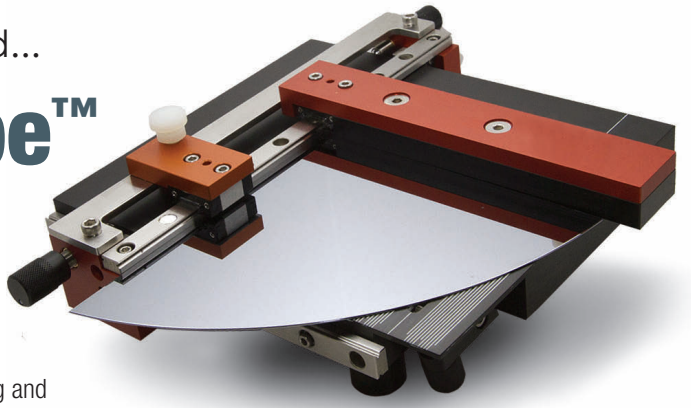
Assembly Process of Microscopic Fluid Chips



scribing reinvented...

FlipScribe™

Scribing and Cleaving Solution



FlipScribe™ is a compact, stable, accurate, fast and low cost scribing and cleaving solution suitable for any lab; no utilities required. It provides a more accurate method for scribing than can be achieved with hand held tools, by integrating a robust diamond scribe into a sample platform with a fence guide design. Time required to align and scribe is about a minute.

FlipScribe takes scribing to a new performance level, making clean, straight scribe lines on the back side to accurately cleave front side targets, bonded wafers and other substrates. This method eliminates contamination of sensitive front side devices during the scribing processes and is valuable for both crystalline and amorphous samples.

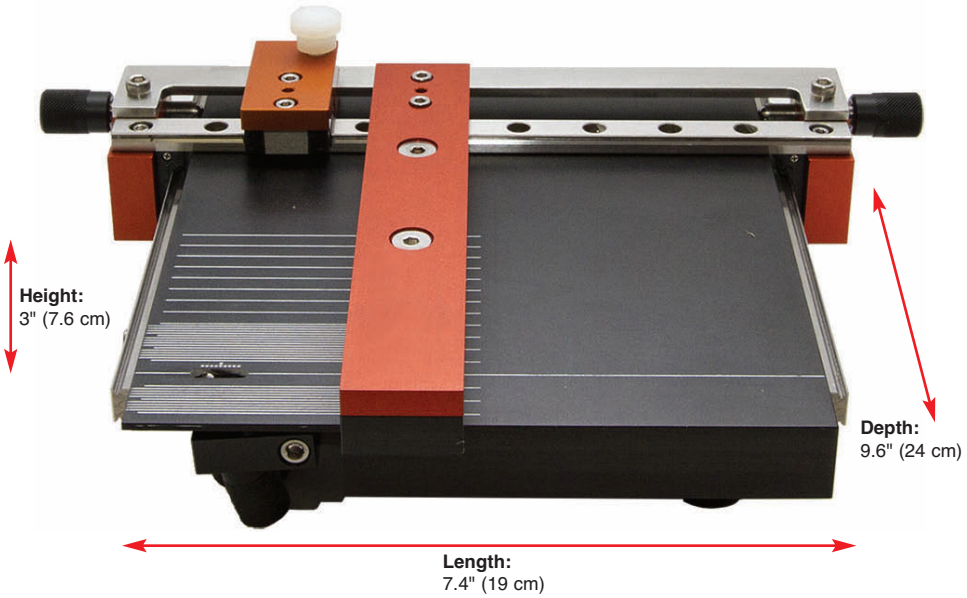
Benefits

- **Enables accurate cleaving through frontside targets with a scribe made on the backside of the substrate**
- **Scribe does not damage the frontside of the sample**
- **Accuracy of scribe ±200 µm (achievable)**
- **Flexible with respect to sample size and shape**
- **Capable of scribing bonded crystalline and amorphous wafers and chips for subsequent cleaving**
- **No maintenance required**

Features

- **Accurate positioning of the scribe relative to features on the front side (the front side being observed either by eye or with a stereoscope).**
- **The length of the scribe can be varied from 1 mm to 100 mm**
- **Prealigned diamond scribe in user replaceable cartridge; height and angle adjustable**
- **Ruler embedded in platform enables precise and repeatable sample alignment and sizing**
- **The tool is purely mechanical; no power required**

FlipScribe has a small footprint, allowing it to be placed on any work surface.



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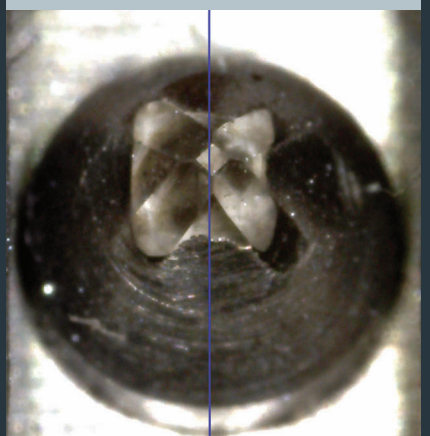
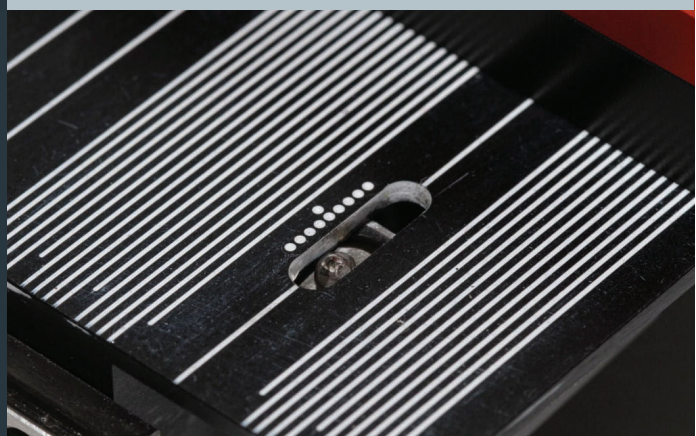
Faceted diamond scribe; blue line across cutting edge



Scribing area showing ruler



Specifications

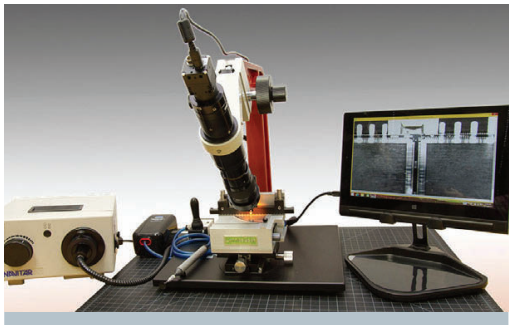
Cleaving Accuracy	± 200 µm
Cleaving Cycle Time	1-2 minutes
Minimum Sample Size	3/8" /9.5 mm (L) × ¼"/6.3 mm (W) × .01"/300 µm (H)
Maximum Sample Size	Wafer: 4" (100 mm); ¼ of 12" (300 mm) Non-Wafer: 3/8"/ 9.5 mm (L) × 1/4"/6.3 mm (W) × .01"/300 µm (H)

Configuration

Rail and Guide System	Maintains sample orthogonality and method to push the sample when scribing.
Sample Platform	7" (178 mm) × 6" (152 mm); ruled to facilitate sample sizing
Scribe Stop	Sets the length of the scribe; continuously variable >1 mm - 4" (102 mm)
Diamond Scribe	Pre-installed diamond scriber with an eight (8) point diamond tip tool and 4 facets at 45° angle.

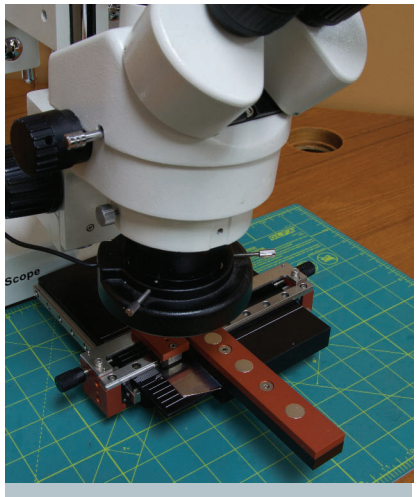
Installation Requirements

Flat work surface
No power required
Stereo microscope with parfocal zoom recommended
No assembly required



Pair the FlipScribe with a LatticeAx cleaving machine to fully support a complete, high accuracy scribe and cleave workflow.

Shown here: LatticeAx 420.



It is very useful to use the Flipscribe with an optical microscope. Set the Flipscribe such that the diamond scribe is centered in the field of view at the lowest magnification.

Options

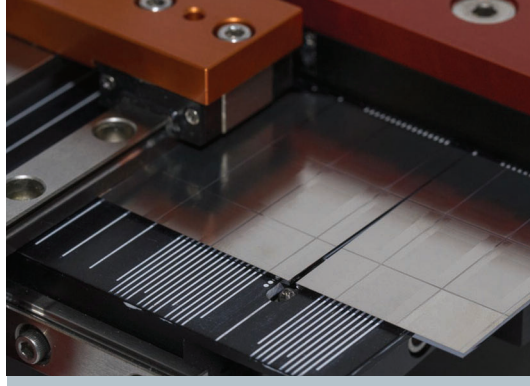
LatticeAx™ (LGAX-420LG)
LatticeAx cleaving machine for analysis-ready samples with accuracy to ±10 microns

Small Sample Cleaver (MC-SSC-100)
Cleaver for small samples, includes sample holders and cleaving apparatus

Wafer Cleaving Kit (WCSK-102LG)
Wafer cleaving kit including pliers and scribers

Ordering Information

Cat. No.	Description	Qty.
7670	FlipScribe™ 100	each



Semiconductor sample after scribing and cleaving

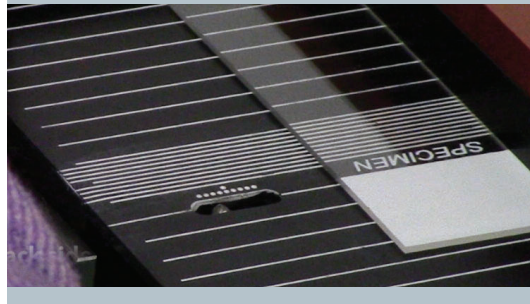
APPLICATION NOTES:

Scribing Crystalline Materials

The best results for crystalline materials are obtained when using a short scribe.This results in a cleave along the crystal plane. In some cases if the leading edge of the sample is uneven or curved, a long scribe is required to initiate the cleave.

Scribing Amorphous Substrates

Amorphous and polycrystalline materials require the scribe to extend across the entire sample. In some cases a short scribe can be used to initiate the sample fracture, this produces a very clean edge desirable for SEM. The fracture is typically not straight but this is a good method if accuracy is not required. For glass, a deep scribe is not required.



Glass slide example

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Electron Microscopy Sciences


Lavender Leaf 150X

Why 3D?

- **The real world is 3D**
- **Reduce misinterpretation and misdiagnosis**
- **Increase productivity**

Why Edge® 3D?

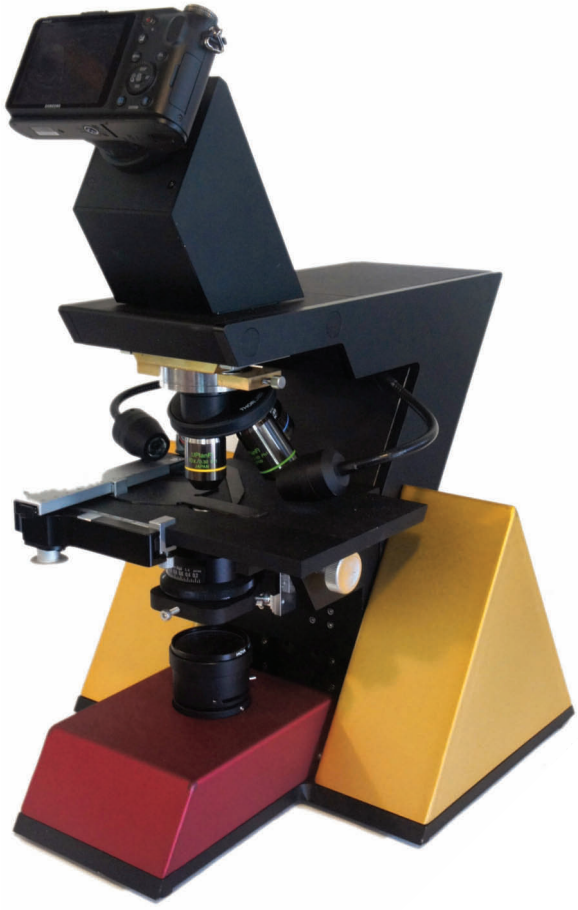
- **Fully automated 3D imaging**
- **Plug & play and user friendly**
- **Breakthrough value**

Features

- **Modes of 3D imaging**
  - Stereo 3D using active 3D glasses
  - Stereo 3D using Red/Cyan 3D glasses
  - Motion Parallax 3D Movies (no glasses required)
  - 3D Surface Profiling of Specimens
- **Automated Z-Focus Stacking Produces Extended Depth of Focus Images**
- **Uses Standard Objective Lenses 2X to 100X with Magnifications over 1,000 times**
- **Transmitted Light**
  - Brightfield
  - Darkfield
  - Phase Contrast
  - Oblique Illumination and Polarization
- **Reflected Light**
- **Fluorescence Module (coming soon)**
- **Edge® 3D Panfocal™ Software**
  - User Friendly Plug & Play System
    Controls the microscope
    Performs 3D image analysis

Edge® Digital 3D Micro/Macroscopes

powerful and affordable 3D light microscopes
for Industry, Research, Biomedicine, Education

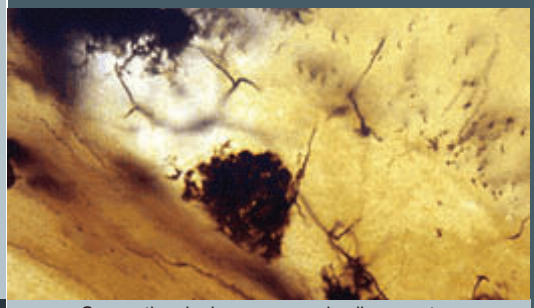


The Edge® 3D Microscope is a highly sophisticated digital 3D microscope with a wider variety of features than are found in expensive 3D confocal microscopes and for a fraction of the cost!

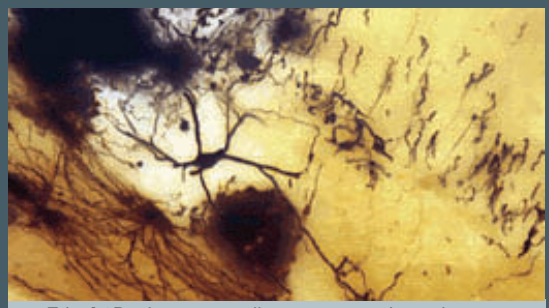
The microscope is one of the most important tools for science and industry. Although microscope specimens are three-dimensional objects, the vast majority of conventional microscopes produce only flat, two-dimensional images, with extremely shallow depth of field. With the advent of computers, lasers and robotics, the poor depth of field problem has been solved. Automated microscopes can take a series of images at different focus points, and then the out-of-focus portions are removed from each image. A computer reconstructs the in-focus portions of the image with dramatically extended depth and clarity. Until now, these new and revolutionary advances in 3D imaging have not been translated into affordable microscopes. To address this problem, The Edge® has been developed as a unique 3D microscope with extended depth of focus and clarity that is inexpensive and user friendly. It is an innovative superior 3D light microscope with the flexibility and multiple features of a universal microscope.

Conventional Microscopes **Edge® 3D Microscope Z-Focus Stacking**

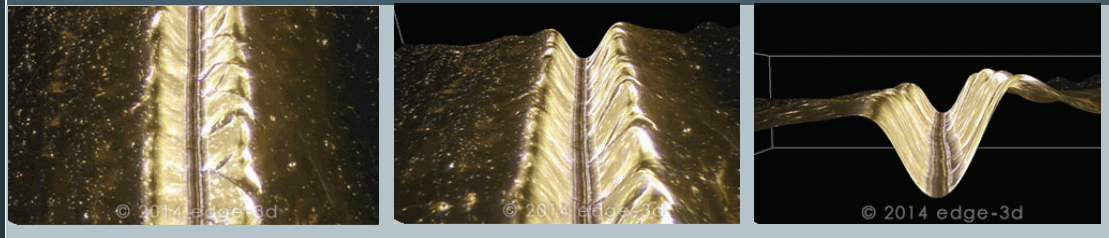
Sample = Golgi Stained Neurons, transmitted light



Conventional microscopes only allow you to see small portions of the image in focus at a time.



Edge® 3D microscopes allow you to see the entire image in focus with Z-Focus Stacking technology.



With conventional microscopes it is sometimes very difficult to make clear observations. The Edge-3D microscope's 3D Model mode provides valuable perspective and control to your samples. *Sample = Gold Plate*

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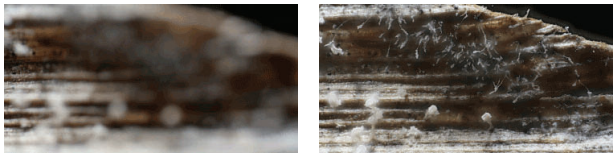
Conventional microscopes only allow you to see small portions of the image in focus at a time. Edge 3D microscopes allow you to see the entire image in focus with Z-Focus Stacking technology.

Applications

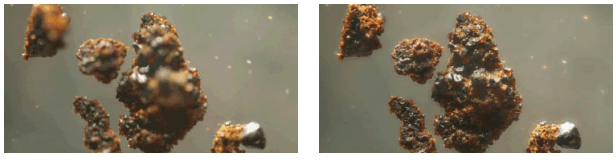
Conventional Microscopes | Edge® 3D Microscope

Biology
Edge®'s extended depth of focus features provide greatly enhanced imaging of thick, real-world specimens encountered in applications such as Marine Biology and Plant Biology.



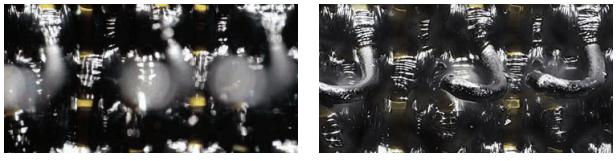
Micro Mushrooms

Geology
With the 3D technology of the Edge®, one can examine rocks, pebbles, sand or polished sections, all with amazing three-dimensional clarity.



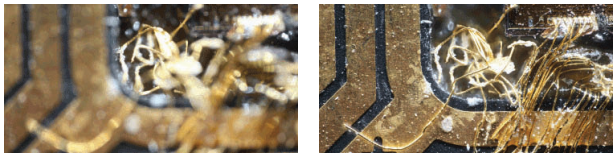
Moon Dust (Apollo 17)

Industry
The full depth of focus 3D features of the Edge® microscope make it ideal for examining a large range of different industrial products for quality control, production line vision, and failure analysis applications.



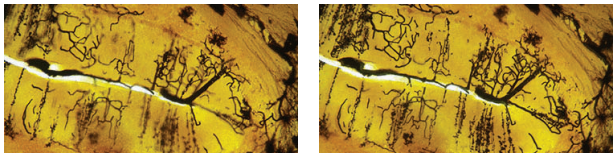
Velcro

Microelectronics
The Edge® 3D microscope will help to solve the difficult problems encountered in visualizing the placement and integrity of circuitry components, such as bond testing application.



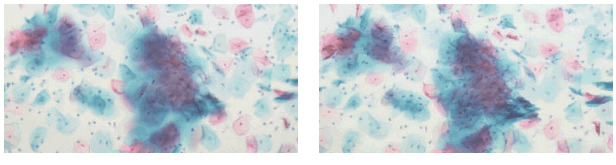
Bond Testing

Neuroscience
The nervous system is a complex three-dimensional network. The Edge® 3D microscope is the ultimate neurobiology microscope as it defines and reveals otherwise ambiguous areas in samples.



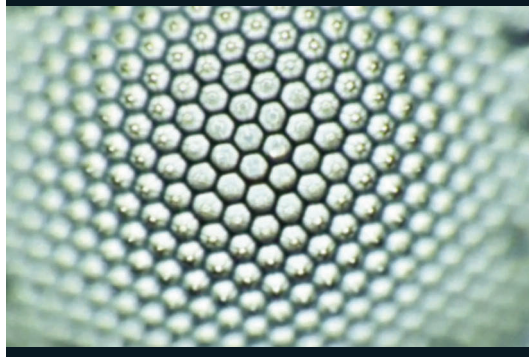
Brain Vessels

Pathology
Cytopathology is a perfect application for the Edge® 3D microscope, as specimens such as PAP smears and needle biopsies are very three-dimensional by nature. The rich depth information that the Edge® 3D microscope provides results in less false negatives. Users are encouraged to section their samples 50 micron thick, rather than the standard 5 micron sections. Three-dimensional visualization of thick samples improves both productivity and accuracy.



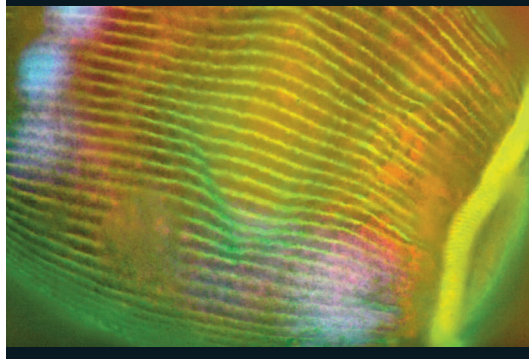
PAP Smear

Magnifications to 5000X



Diatome

Fluorescence Imaging



Embryo

HD Video Output

Pollen on Leaf

Polarization Imaging

Sugar Crystals

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Specifications

Application Specifications

Edge® Panfocal™ 3D Software controls stage focus, illumination, image capture, and performs 3D image analysis

Plug and Play 3D Control & Display Unit includes:
- Alienware 3D Computer with Nvidia Graphics Card
- 24 inch 3D Monitor
- 3D Emitter with Active 3D Glasses

Illumination
Transmitted Illumination, Reflected Illumination, Epi-Fluorescence Illumination (optional accessory)

Compatibility with most optical systems, including:
Brightfield, Darkfield (optional accessory), DIC (optional accessory), Polarization (optional accessory), Epi-Illumination (optional accessory), Oblique Illumination

Magnification Range
Uses conventional microscope objective lenses with objective magnifications from 2x-100x resulting in screen magnifications of over 5,000 times

Resolution (X-Y Dim.) 250 nm (using 1.4 NA Plan Apo Optics)

Physical Specifications

Size	30 x 30 x 36 cm
Weight	14 kg
Construction	Anodized aluminum
Electrical Requirement	100-240V, 50-60Hz
Electrical Connections	1 USB2 output 1 Transformer connection
Reflected Lights	2 LEDs rated at 1 Watt each
Transmitted Lights	2 LEDs rated at 1 Watt each
T-2 Adapter	Connects to wide variety of cameras
Camera	20 Megapixel camera with full HD video
Lens Turret	Places for 4 RMS objective lenses
Optical System	• Edge DIN Camera Head is compatible with most 160 mm tube-length objective lenses • Infinity Camera Head is compatible with most Infinity lenses including Olympus & Motic (not compatible with Zeiss objective lenses)
Objective Lenses	2x-100x (not included)
Stage Focus	Automated motorized stage controlled by Edge 3D Software
Focus Travel Range	50 mm in 2 micron steps
X-Y Stage Dimensions	220 x 150 mm

Six Modes of 3D Imaging
- Stereo viewing in real-time
- Motion parallax 3D viewing in real-time
- Automated Z-Focus Stacking
- Full-focus image stacks in Stereo 3D
- 3D profiling of surface topology
- Full-focus motion parallax movie loops

System Includes

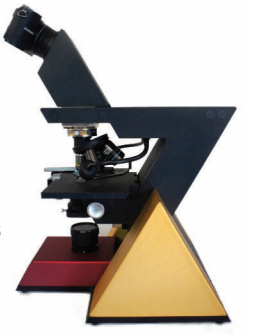
- Edge® 3D Microscope Body
- Achromatic Condenser Lens
- Camera Head
- 3D Control Unit with Nvidia 3D Graphics Card
- 3D Display System with 24 inch Monitor and Active Glasses

Optional Accessories

- Choice of USB 3 or DSLR Cameras
- Range of Objective Lenses available
- Objective Turret for 25M threaded objectives, such as Nikon
- Epi-Illumination Fluorescence (1, 2, 3 or 4 LED Systems)

Edge® Digital 3D Microscope

With Z-Axis Stacking and Six 3D Imaging Modes



The Edge® 3D Light Microscope delivers three-dimensional imaging with extreme versatility. Packaged in an anodized aluminum body, the Edge® 3D Microscope is a truly high-performance Plug-and-Play microscope.

With the innovative Edge® 3D Panfocal™ Z-Stacking Software Package, the user is able to control stage focus, illumination, image capture, and perform 3D image analysis.

Ordering Information

96500	Edge® Digital 3D Microscope System Includes: 3D Computer Control Unit 24" 3D Display System with 3D Glasses Edge® 3D Panfocal Software Package Camera Head	each
96500-20	Digital SLR Camera - Optional	each
96500-25	USB3 Video Camera (5 MP) - Optional	each
Motic Infinity Plan Apochromatic Objective Lenses		
96500-40	4x - N.A. 0.15; W.D. 20mm	each
96500-41	10x - N.A. 0.35; W.D. 4.2mm	each
96500-42	20x - N.A. 0.65; W.D. 0.7mm	each
96500-43	40x - N.A. 0.95; W.D. 0.1mm	each
Motic Plan Fluar Objective Lenses		
96500-50	Plan Fluar Objective 4x	each
96500-51	Plan Fluar Objective 10x	each
96500-52	Plan Fluar Objective 20x	each
96500-53	Plan Fluar Objective 40x	each
96500-54	Plan Fluar Objective 50x Oil	each
Motic Phase Contrast Objective Lenses		
96500-60	PL Ph10x/0.25	each
96500-61	PL Ph20x/0.4	each
96500-62	PL Ph40x/0.65/S	each
96500-63	PL Ph100x/1.25/S-Oil	each
Motic Condenser Lenses		
96500-70	Phase Contrast 5 Position Turrer Condenser	each
96500-71	Abbe Condenser	each
Olympus Plan Fluorite Objective Lenses		
96500-80	4x - N.A. 0.13	each
96500-81	10x - N.A. 0.3	each
96500-82	20x - N.A. 0.5	each
96500-83	40x - N.A. 0.75	each
LED Fluorescence Unit		
96500-90	One Color Options: 365nm/450nm/ 475nm/530nm	each
96500-91	Two Color Unit: Blue & Green	each
96500-92	Four Color Unit: 365nm/405nm/ 475nm/530nm	each

3D Pan-Focal Macro/Microscope

improves accuracy and increases productivity

Panfocal 3D software controls the focus of the camera to produce a stack of images, each taken at different focus levels. The stack of images is processed to remove the out-of-focus blur and an extended depth of focus image is produced that can be seen as a 2D picture, stereo 3D picture, rotational 3D movie, or surface profile.

Features

- Automated Z-Focus Stacking
- Extended Depth of Focus
- Rotational 3D Imaging
- Stereo 3D Imaging
- Surface Profiling

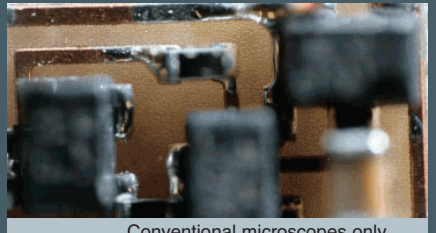
Basic Unit includes

- Chassis and Body constructed of aluminum
- Auto-focusing camera head with 1/4-20 mount
- Automated Z-Axis Focus with 2 inch travel
- Manual focus with 12 inch travel
- 3D Computer with 24 inch 3D Monitor
- Edge® Panfocal™ 3D software

The Edge 3D microscope's 3D model mode provides valuable perspective and control to your samples.

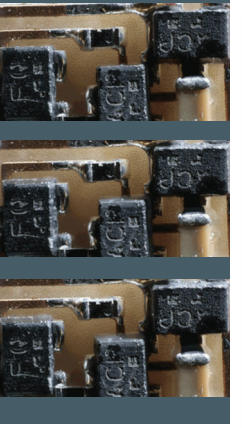
Conventional Microscopes **Edge® 3D Microscope Z-Focus Stacking**

Sample = Microelectronics



Conventional microscopes only allow you to see small portions of the image in focus at a time.

Edge® 3D microscopes allow you to see the entire image in focus with Z-Focus Stacking technology.



Ordering Information

96510	Edge® 3D Pan-Focal Macro/Microscope 3D Computer Control Unit Includes: 24" 3D Display System with 3D Glasses, Edge® 3D Panfocal Software Package (Camera and lenses not included)	each
96500-20	Digital SLR Camera (Nikon D3300 Camera, 60mm f/2.8 macro lens)	each
96500-25	USB3 Video Camera(5 MP)	each
96500-10	Infinity Tube Accessory for C-Mount Video	each
96500-15	Infinity Tube Accessory for T-2 Mount DSLR	each
Motic Infinity Plan Apochromatic Objective Lenses		
96500-40	4x - N.A. 0.15; W.D. 20mm	each
96500-41	10x - N.A. 0.35; W.D. 4.2mm	each

Contact us for more information on available optical front ends.

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Electron Microscopy Sciences

Mic-Fi Digital Wi-Fi Microscopes

the new state-of-the-art way to observe the micro-world

Overview

Mic-Fi is a line of versatile, portable digital microscopes with Wi-Fi transmission. Every device can be connected to iOS and Android smartphones or tablets through a specific Mic-Fi App or through a Wi-Fi/USB connection to computers and laptops (Windows or Mac).

These Wi-Fi digital microscopes are very innovative and break the conception of traditional microscopes to realize the following functions: measurement, conservation, copy and transfer of images and video, which are difficult for a traditional microscope. They are small, easy to operate, light, and portable. They can be used with all the most popular smartphones, tablets and even with PCs. This is the new state-of-the-art way to observe the micro-world!

Fields of Application

- **Industrial Inspection**
- **Electronic and Mechanical Quality Control**
- **Scientific Teaching Tool**
- **Increase Productivity**
- **Research and Scientific Analysis**
- **Forensic Analysis**
- **Dissection**

Included:

- **Transparent Cap**
- **USB AC adapter**
- **USB cable**
- **Quick Manual**
- **Plastic Stand**
- **Line Calibration Ruler**

Specifications

Operating System	Windows, OS X, iOS, Android (can be used by Wi-Fi or USB)
Photo and Video Resolution	1.3mp – 1280 x 1024, 640 x 480, 320 x 240
Frame Rate	15fps @ 1280 x 1024, 30fps @ 640 x 480, 320 x 240
Wi-Fi Protocol	IEEE 802.11 b/g/n standards compliant
Wi-Fi Transmission Distance	up to 5m
Transmit Power	11n HT40 MCS7: +13 dBm 11b CCK: +18 dBm 11g OFDM: +15 dBm
Data Rate	802.11n: up to 150 Mbps 802.11b: 1, 2, 5,5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
Frequency Range	2.400 ~ 2.4835GHz
Power Consumption	Max 2.5W
Frame Rate	10 fps ~ 30 fps
Li-ion Battery	Continuous Working Time: Approx 2 Hours Full Charging Time: Approx 2 Hours
Power Source	DC5.0V/1A
Camera Specifications	
Camera Sensor	CMOS 1/4"
Optical Features	Automatic Exposure, Gamma, White Balance, Black Reference
USB Specifications	
Photo and Video Resolution	1.30 mp - 1280 x 1024, 640 x 480, 320 x 240
Frame Rate	15 fps (1280 x 1024), 30fps (640 x 480), 320 x 240
PC Interface	USB 2. 0
MiniUSB Cable for Recharging	1.2m

Electron Microscopy Sciences

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Hatfield, Pa 19440
Tel: (215) 412-8400 • Fax: (215) 412-8450
email: sgkcck@aol.com
or stacie@ems-secure.com
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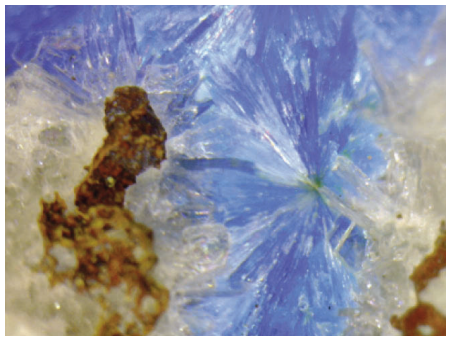
APPLICATIONS:

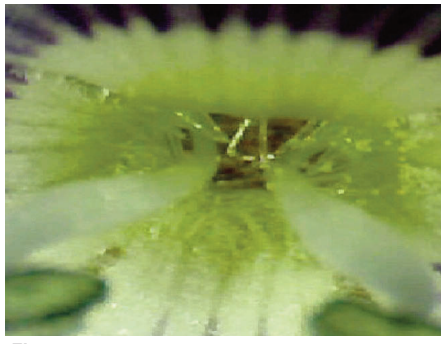
Science and Education: Laboratory / Research / Entomology / Botany / Archaeology / Mineralogy / Paleontology / Ecology


Trichomes


Linarite

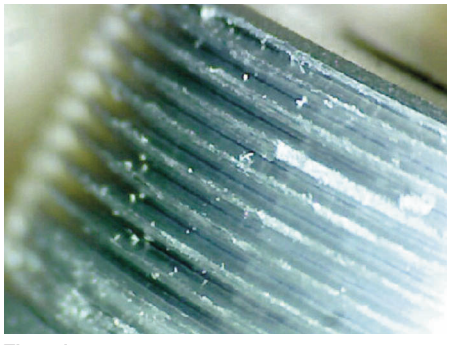

Amber

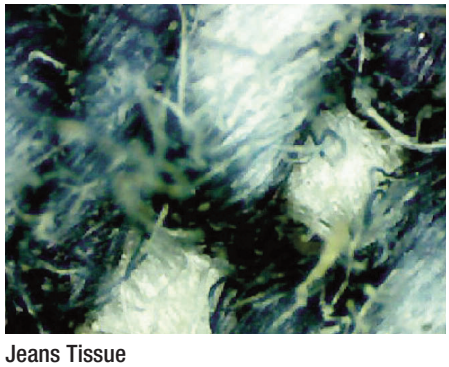

Micro-shell

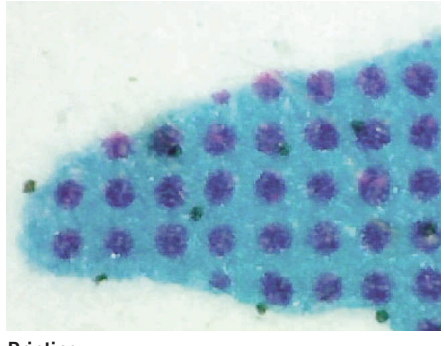

Flower

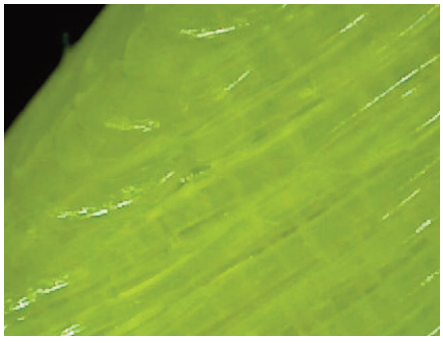

Coffee Bean

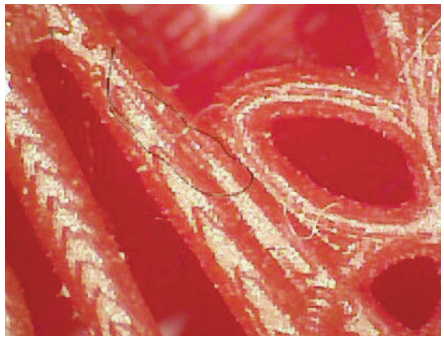
Industry: Engineering Integration / Quality Control / Editing / Printing / Repair / Inspection Textiles / PCB / IC / LCD / Solar Panels / Agriculture

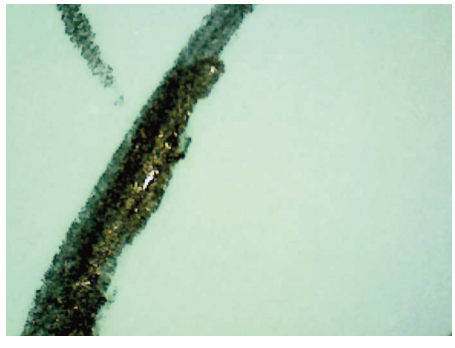

Thread


Jeans Tissue


Printing


3D Printing Filaments


3D Print Jewelry Details


Graphology

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Electron Microscopy Sciences

Mic-Fi Standard Wi-Fi Digital Microscope

Magnification	Working Distance	Field of View (x)	(y)
10	157	39	29
20	73	20	15
30	41	13	10
40	30	10	7.5
50	22	8	6
60	17	7	5
80	14	5	4
100	11	4	3
150	13	2.5	2
200	19	2	1.5

Listed values may differ slightly. Working distances have been taken without front cap. Contact point: Low Cover: 80x e 150x, High Cover: 60x e 200x

Microscope Specifications

Magnification	5x ~ 200x
Object Distance	8 ~ 200 mm
Focus Range	8 mm ~ 200 mm
Light Source	n. 8 adjustable White Led
Lens	High Definition Microscopy Lens
Dimensions	36 mm (Diameter) x 142 mm (Length)
Weight	88g

99500-01	Mic-Fi Standard Wi-Fi Digital Microscope	each

Mic-Fi Polarized Wi-Fi Digital Microscope

Magnification	Working Distance	Field of View (x)	(y)
10	139	39	29
20	59	20	15
30	27	13	10
40	19	10	8
50	13	8	6
60	7	7	5
80	1	5	4
100	0	4	3
150	1	2.5	2
200	7	2	1.5

Listed values may differ slightly. Working distances have been taken without front cap. Contact point: Low Cover: 80x e 150x, High Cover: 60x e 200x

Microscope Specifications

Magnification	5x ~ 200x
Object Distance	8 ~ 150 mm
Focus Range	8 mm ~ 150 mm
Light Source	n. 8 adjustable White Led
Lens	High Definition Microscopy Lens
Dimensions	36 mm (Diameter) x 142 mm (Length)
Weight	88g

99500-02	Mic-Fi Polarized Wi-Fi Digital Microscope	each

Mic-Fi Wi-Fi Digital Microscope with UV + White Light

Magnification	Working Distance	Field of View (x)	(y)
10	157	39	29
20	73	20	15
30	41	13	10
40	30	10	7.5
50	22	8	6
60	17	7	5
80	14	5	4
100	11	4	2
150	13	2.5	2
200	19	2	1.5

Listed values may differ slightly. Working distances have been taken without front cap. Contact point: Low Cover: 80x e 150x, High Cover: 60x e 200x

Microscope Specifications

Magnification	5x ~ 200x
Object Distance	8 ~ 200 mm
Focus Range	8 mm ~ 200 mm
Light Source	n. 4 adjustable White Led + n. 4 adjustable UV Led (400nm)
Lens	High Definition Microscopy Lens
Dimensions	36 mm (Diameter) x 142 mm (Length)
Weight	88g

99500-03	Mic-Fi Wi-Fi Digital Microscope, UV + White Light	each

Mic-Fi Wi-Fi Digital Microscope with Long Distance Working Optics

Magnification	Working Distance	Field of View (x)	(y)
9	450	105	66
10	320	55	46.1
30	59	14	11
40	39	10	8
50	31	9	6.5
60	29	7.5	5.5
80	22	5	4
100	19	4	3
120	18	3	2.3
160	22	2.5	2

Listed values may differ slightly. Working distances have been taken without front cap.

Microscope Specifications

Magnification	10x ~ 160x
Object Distance	8 ~ 450 mm
Focus Range	8 ~ 450 mm
Light Source	n. 8 adjustable White Led
Lens	High Definition Microscopy Lens
Dimensions	36 mm (Diameter) x 142 mm (Length)
Weight	88g

99500-04	Mic-Fi Wi-Fi Digital Microscope, Long Distance	each

Mic-Fi Wi-Fi Digital Microscope with High Magnification

Magnification	Working Distance	Field of View (x)	(y)
500	0	0.76	0.58
530	2	0.69	0.53
550	3.2	0.63	0.48
600	0	0.60	0.45

Listed values may differ slightly. Working distances have been taken without front cap. Contact point: Low Cover: 560x, High Cover: 630x

Microscope Specifications

Magnification	500x ~ 600x
Object Distance	0 ~ 3 mm
Focus Range	0 ~ 3 mm
Light Source	n. 8 adjustable White Led
Lens	High Definition Microscopy Lens
Dimensions	36 mm (Dia.) x 142 mm (L)
Weight	88g

99500-05	Mic-Fi Wi-Fi Digital Microscope, High Magnification	each

Mic-Fi Racks and Stands for Mic-Fi Digital Wi-Fi Microscopes

LED Backlighting Rack w/vertical movement and slide adjustment.

Power: 4 AA Batteries or USB

99500-09

Vertical Moving Rack

99500-06

Vertical & Horizontal Moving Rack

99500-07

Basic Stand

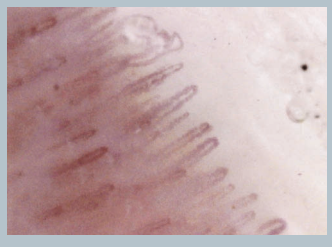
99500-08

Cat. No.	Description	Qty.
99500-06	Mic-Fi Vertical Moving Rack	each
99500-07	Mic-Fi Vertical & Horizontal Moving Rack	each
99500-08	Mic-Fi Basic Stand	each
99500-09	Mic-Fi Backlight Rack	each

APPLICATIONS:

Medical Field:

Dermatology / Iridology / Trichology / Laboratory / Veterinary / Dental / Capillaroscopy / Otolaryngology

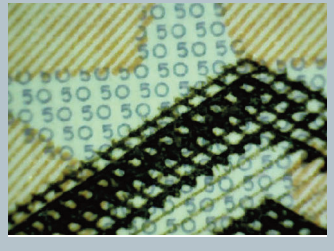


Capillaries

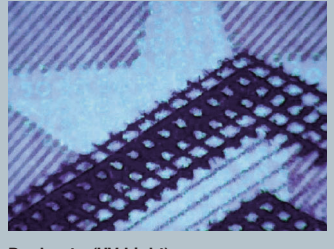
Forensics:

Law Enforcement / Forgery

Holographic Stripe Banknote



Banknote



Banknote (UV Light)

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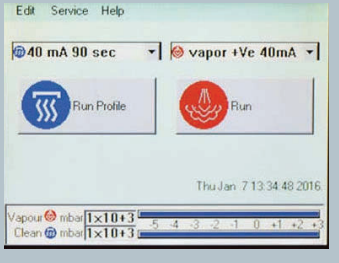
Electron Microscopy Sciences

EMS GloQube™ Glow Discharge System for TEM Grids

the first-of-its-kind, compact, easy to use, stand-alone glow discharge system

EMS GloQube-D and Optional Pfeiffer DUO 6 Rotary Pump

Vapor Delivery System



EMS GloQube™ Start-up Screen

Key Features

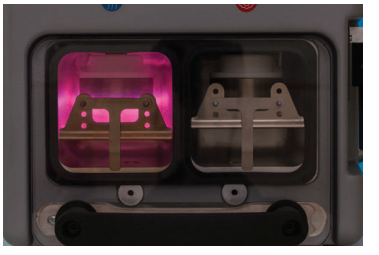
- **Dual independent chambers**
- **Hydrophilic/hydrophobic and negative/positive modes**
- **Fully automatic, short process times**
- **Intuitive touch screen control**
- **Safe vapor delivery using septum-sealed vials**
- **Automatic valving between chambers to prevent cross-contamination**
- **Quick and easy sample loading**
- **Controlled venting to prevent sample disturbance**
- **Consistent, reliable results**
- **Three-year warranty**

Unique Dual Chamber Processing, Safe Handling of Reagents

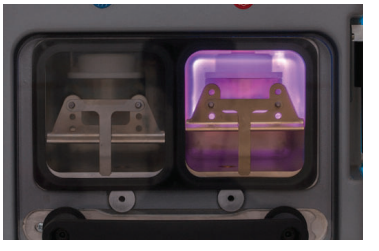
The GloQube has two independent vacuum chambers: a clean chamber, designed for applications requiring hydrophobic/hydrophilic conversion, typically using air as the process gas; and a vapor chamber, designed for use with reagents such as methanol and alkylamine. With operator safety firmly in mind, reusable septum-sealed reagent vials are used. Loading and removing reagents is convenient and reliable – the vial, located in its holder, is inserted into a shielded needle using a simple bayonet fitting.

To prevent accidental damage, the high voltage lead is shielded. The plasma current is variable by adjustment of the vacuum level using an argon leak valve with the plasma voltage being preset. For maximum sputter coating efficiency, the gas injector system ensures that argon gas enters the chamber close to the plasma discharge. Venting is to argon.

The primary application of the EMS GloQube™ is the hydrophilization (wetting) of carbon-coated TEM support films and grids which otherwise have the tendency to be hydrophobic. Glow discharge treatment with air will make film surfaces negatively charged and hydrophilic and allow the easy spread of aqueous solutions. This and other processes are outlined below.



Clean Chamber



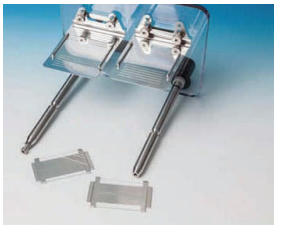
Vapor Chamber

Glow Discharge Process

Surface State	Charge	Atmosphere	Typical Applications
Hydrophilic	Negative	Air	Carbon coated TEM grids
Hydrophilic	Positive	Air – with magnesium acetate post-treatment	Nucleic acid adhesion to carbon films
Hydrophilic	Positive	Alkylamine	Proteins, antibodies and nucleic acids
Hydrophilic	Negative	Methanol	Positively charged protein molecules (e.g. ferritin, cytochrome c)

Easy Sample Loading, Fast Turnaround Times

Each chamber can accommodate two 25 x 75 mm glass microscopes slides. Loading could not be easier using draw-style chamber doors and specimen stages. The stages are height adjustable and fitted with removable glass slide holders. For additional convenience – and to allow easy access for chamber cleaning – the stages can be completely removed.



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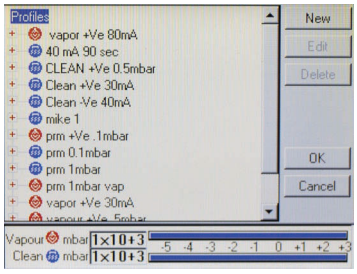
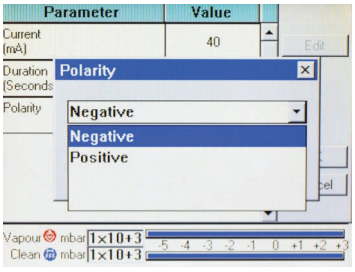
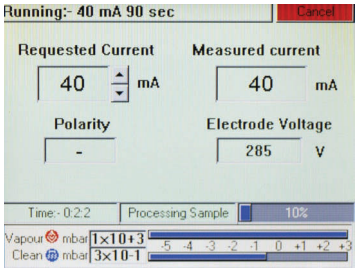


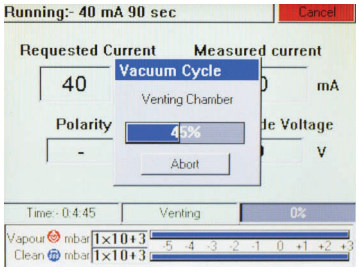
Stored Profiles



Selecting a New Profile



A Typical Process Run



Pumping Cycle

Touch Screen Control – Rapid Data Input, Simple Operation

The intuitive touch screen allows multiple users to rapidly input and store preferred process "recipes". Typical default glow discharge protocols are loaded as standard. Additionally, help files and useful maintenance data such as system on time and time since last clean are readily available to the operator. An Ethernet communications port is included for software updates.

Vacuum, Automatic Valving and Controlled Venting

The GloQube™ has automatic valving between chambers which maintains cleanliness by preventing cross-contamination. At the end of a process run, automatic soft venting to atmosphere through filtered inlets ensures TEM grids are not disturbed. The GloQube™ requires a single vacuum pump working in the 0.1 to 1 mbar range. A typical pump time to operational vacuum is 60 seconds.

Ordering Information

Cat No.	Description	Qty.
EMS-Glo-2	EMS GloQube, Dual chamber glow discharge system. Accessory kit, including: mains power lead, rotary pump power lead, oil mist filter and clamp, 750 mm long flexible stainless steel vacuum tube with clamps, fuses, glass vials, vial caps and sealing washers, needle (spare). Vacuum pump to be ordered separately.	each
Vacuum Pumping		
91003	5 m^3/hr Pfeiffer DUO 6 two-stage rotary vacuum pump with oil mist filter	each
96000	Oil mist filter (spare)	each
Options, accessories and spares		
EMS-Glo-11	Microscope Slide Tray	each
EMS-Glo-12	Glass Vial	10/pk
EMS-Glo-13	Glass Vial Caps	3/pk
EMS-Glo-14	Needle	each
EMS-Glo-15	Door Seal	each

Specifications

Power and Processes

Plasma current	1-40 mA
HV power supply	30 W
Maximum voltage	800 V
Electrode polarity – clean chamber	DC glow positive DC glow negative
Electrode polarity – vapor chamber	DC glow positive DC glow negative
Sample stage	125 x 100 mm (4.9" x 3.94") with location for two 25 x 75 mm (1" x 3") glass slides
Sample stage operational heights	Adjustable 12.5 mm (0.5"), 22.5 mm (0.9") or 35 mm (1.38")
Pump hold time req.	0-24 hours
Process time	1-600 seconds

Safety

Chamber vent inlets	Filtered air inlets with slow vent to minimize sample disturbance
On-board reagent storage	Reagents (e.g. methanol or alkylamine) are contained in reusable sealed glass vials to minimize exposure to hazards. (GloQube-D only)
High voltage safety interlocks	Hardware safety interlocked and software for process control

Vacuum

Vacuum control	Integrated pirani gauge
Working vacuum range	0.1 to 1 mbar
Vacuum pump minimum requirements	6 m^3/hr, 3600 l/m, 0.03 mbar ultimate vacuum. Inlet flange: KF 16
Pumping time	Typical pump time to an operational vacuum of 0.27 mbar in 60 seconds
Vacuum isolation	Isolation valves to switch vacuum and prevent process chamber cross-contamination

User Interface

User interface	Full graphical interface with touch screen buttons and controls. In addition to displaying profiles, parameters, help screen and maintenance information are available
Profiles and profile logging	Capability to store 100 user profiles (name, date, time, vacuum, current and polarity)

Dimensions and Communications

Chamber size	100 mm W x 100 mm H x 127 mm D (3.94" x 3.94" x 5")
Instrument size	336 mm H x 364 mm D (13.2" x 14.3")
Instrument weight	19.5 kg (42.9 lbs) (GloQube-D)
Pump (optional)	391 mm W x 127 mm D x 177 mm H (15.4" x 5" x 7")
Pump weight	16 kg (35.3 lbs)
Footprint with optional pump	366 mm W x 600 mm D x 336 mm H (14.4" x 23.6" x 13.2")
Power requirements	120 V 60 Hz, 15 A or 230 V 50 Hz, 10 A
Instrument power rating	100-240 V AC 60/50 Hz 700 VA including pump, IEC inlet
Optional pump power rating	115/230 V 60/50 Hz 450 W
Communication port	Ethernet port for instrument software updates

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Electron Microscopy Sciences

Evactron® Series Decontaminators and Cleaning Systems

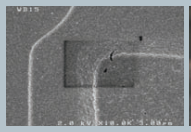
reduce hydrocarbon contamination in vacuum chambers, improving electron microscope imaging and analytical performance

Overview

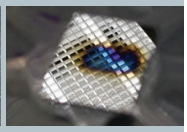
Volatile hydrocarbon molecules are an unavoidable constituent of all vacuum chambers. They are introduced into the chamber through atmospheric (adventitious) contamination, lubrication, or inadvertent contamination by users. This contamination does not pose an issue in and of itself.

However, if energetic radiation such as the electron beam of a scanning electron microscope, an ion beam from a FIB, or EUV radiation of the next generation of lithography tools is used, then the hydrocarbon contamination will cause problems. As the hydrocarbons adsorb onto a surface impinged by the energetic radiation, e.g. a sample examined in an SEM or a mirror in an EUV lithography tool, they will be chemically altered by the radiation and then recombine into less volatile polymers. More adsorbed hydrocarbons will diffuse into the impingement area, and a buildup of polymeric carbon will occur.

In microscopes this buildup will reduce the image quality. When the user reduces the magnification, a black square due to the carbon buildup will be seen on the SEM image. In EUV lithography, the mirror will also suffer a carbon buildup which will cause a reduction in the reflectivity of the mirror. Less reflectivity will cause a much reduced throughput of the lithography tool.



Black square caused by hydrocarbon contamination seen in SEM image.



Carbon buildup leading to loss in reflectivity seen on an EUV mirror.

Evactron® Model EP Plasma Decontaminators

The Evactron® E-Series™ of remote RF plasma cleaners reduces hydrocarbon contamination from high vacuum chambers by breaking down the carbon and turning it into gas phase that are then removed by the pumping system.

Features

- **High cleaning efficiency**
- **Small footprint/compact plasma radical source (PRS)**
- **Operates at TMP and turbomolecular pressures**
- **"Pop" ignition (patent pending)**
- **Windows and Android GUI software**
- **Desktop controller**
- **Fits chambers and load locks**
- **Vacuum safety interlock**

The Evactron® EP Decontaminator is the latest model in the E-Series cleaning systems. It was designed for:

- Cleaning high vacuum chambers, SEM/FIB
- Pre-cleaning of the samples

The Evactron® EP model with instant ignition from any vacuum level brings the user highest cleaning rates at low pressures. It uses flowing afterglow to remove surface hydrocarbons from vacuum chambers operating with turbo molecular pumps.

Technology

Energy efficient hollow cathode plasma

Flow through gas supply

Plasma Radical Source (PRS) design maximizes delivery of radicals to chamber

"Pop" ignition of the plasma works at pressures below 100 Pa/750 mTorr

Low pressure operation 1-3 Pa/7.5-22.5 mTorr

Starts and operates at turbo molecular pump compatible pressures

Fixed match provides maximum plasma power transfer

Other Features

High reliability at 20 Watts and 13.56 MHz power supply

No vacuum gauge needed

NW 40 flange standard, CF 2.75 optional

Vacuum only operation interlock

>100 Å/min cleaning rates

Rack mount for system integration

Elegant and compact design

Windows GUI interface/Android tablet programming compatibility

Ordering Information *Attachment Flange required, sold separately. See page 30.*

Cat. No.	Description	Qty.
For Hitachi 8200 /4800 Series SEM		
91000-11	Evactron® EP De-Contaminator System, + Android Consisting of: Evactron EP Plasma Radical Source, Horizontal Configuration, Windows 7.0 GUI Programming Software, Evactron EP Table Top Controller, Evactron EP Cable Set (12.5ft), System user manual	each
For JEOL TMP Systems		
91000-12	Evactron® EP De-Contaminator System, + Android, Consisting of: Evactron EP Plasma Radical Source, Horizontal Configuration, 1 cc ignition ballast, Windows 7.0 GUI Programming Software, Evactron EP Table Top Controller, Evactron EP Cable Set (12.5ft), System user manual	each
For Zeiss		
91000-13	Evactron® EP De-Contaminator System, + Android Consisting of: Evactron EP Vertical Plasma Radical Source, Evactron EP Table Top Controller, Evactron EP Cable Set (12.5ft), Evactron EP GUI Programming Software, System user manual	each

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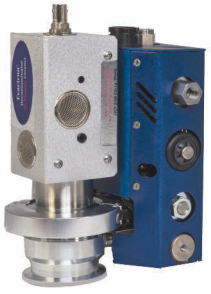


Evactron® Zephyr™ Plasma Decontaminators

The Evactron® Zephyr Decontaminator line was created to accommodate SEMs, FIBs, and other vacuum chambers that use turbo molecular pumps. They are designed for SEM/FIB systems and offer fast and efficient hydrocarbon removal with no damage to samples or sensitive components. They offer users:

- **Cleaning of SEM/FIB chambers at turbo pressure**
- **Shorter cleaning time (increased production, less downtime)**
- **One button operation**

Evactron® Model 25 Zephyr Plasma Decontaminator

- **Desktop controller**
- **SEM/FIB chambers or load locks**
- **2 operating regimes**
  Classic mode (roughing pressures)
  T-pump mode (turbomolecular pressures)

This easy to use tabletop model easily removes atmospheric hydrocarbons and carbon contamination from SEMs, FIBs, and other vacuum chambers.

The Evactron® Model 25 Zephyr Decontaminator uses a remote RF plasma to produce gas-phase radicals that flow downstream through the chamber eliminating contamination.

This model was created for chambers that use turbo molecular pumps (TMPs). It is designed to clean/de-contaminate in the turbo pressure regime at 1-50 mTorr and has no adverse effects on the TMP temperatures.

Features

- **Clean chambers at turbo pump pressures**
- **5-20 Watts RF power**
- **≥10x improved cleaning rate**
- **One button operation**
- **1-50 mTorr operating pressure**

Benefits

- **No stress to the turbo molecular pump**
- **Safely de-contaminates the chamber without damage to sensitive components**
- **Shorter cleaning time, giving increased production with less system down time**
- **Cleans chamber while in "pump down"**
- **Increased mean free path, yet ion damage free**

Ordering Information

Cat. No.	Description	Qty.
91000-10	Evactron® 25 Zephyr Plasma Decontaminator with PRS-V, Vertical Plasma Radical, Source with shroud, Desktop controller and cable set	each

Evactron® SoftClean™ System

Features

- **Windows and Android GUI software**
- **Optional Safar side loaders (US 8,716,676 B2)**
- **Accommodates up to three TEM stage rods**

The Evactron® SoftClean Chamber extends the ability to pre-clean specimens, specimen mounts, and holders with the proven downstream plasma ashing process before examination in the chamber, thus insuring high image quality. The Evactron® SoftClean Chamber can also be used as a specimen storage system, keeping samples in a clean environment.

The downstream plasma process used in the Evactron® SoftClean Chamber is gentle, yet very effective at removing H/C contamination. Sputter etching by other plasma cleaners can damage specimens through exposure to energetic ions and heat.

The Evactron® SoftClean Chamber uses reactive gas radicals to remove H/C from specimen surfaces by chemical etch, preserving critical sample fine structure. This downstream etching process breaks down problematic H/C residues into smaller molecules such as CO_2, H_2O and CO, which are easily pumped out of the chamber.

Specifications

Cleans SEM/TEM samples
Cleans TEM grids/sample rods
Inert sample storage
Just use air for oxygen radicals, or use other gases for alternative plasma processes
Easy setup and operation. Preset pressure, power and time settings
Can be operated from either front panel or computer interface
Optional shroud can cover transducer and valve assembly on the Plasma Radical Source
Start cleaning by using chamber vent and evacuation controls
Advanced plasma detection logic
Cleaning and error logs record history and aid troubleshooting
Electronic Chassis: 3.5"H x 19"W x 7"D (9 x 23 x 48 cm)
RF Power: 5-20 Watts at 13.56 MHz
KF 40 vacuum mounting flange, adapter flanges available
90-250 VAC 50/60 Hz input
Shipping: 20 lb. (10 kg.)

Ordering Information

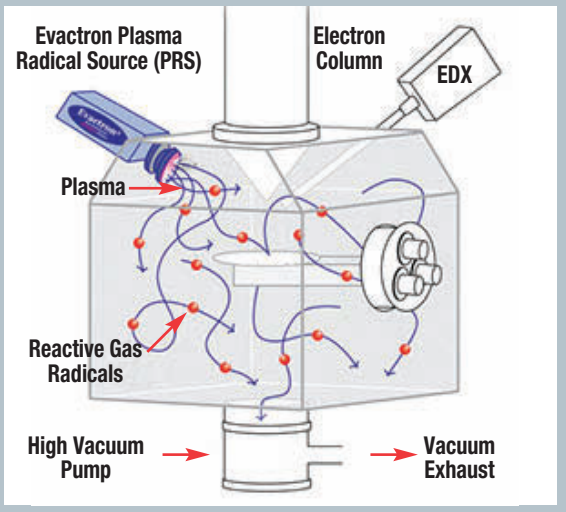
Cat. No.	Description	Qty.
91000-15	Evactron® SoftClean EP	each

Removing Hydrocarbons and Decontaminating Vacuum Chambers with the Evactron Decontaminator

Plasma ashing and glow discharge cleaning of samples have long been cleaning methods available for sample preparation for SEMs and TEMs, but they require expensive auxiliary equipment. Argon and oxygen plasmas are normally used. Argon cleans via a sputter etching mechanism. However, sputter etch should be avoided because of possible damage to components within the chamber.

The Evactron® Decontaminator, on the other hand, is a small device which is attached to any vacuum chamber allowing for direct in situ cleaning of the vacuum chamber. The Evactron® Decontaminator has a valve manifold which introduces a small stream of gas, such as room air, oxygen or hydrogen, into the vacuum chamber. An attached pressure sensor is used to control the amount of gas flow. The gas flows past an electrode energized by a low power (5-20 Watts) radio frequency (RF) generator. This will create RF plasma localized in the region around the electrode.

The Evactron® RF plasma creates radicals that chemically etch and remove hydrocarbons, organics, and surface carbon from SEMs and other vacuum systems. Contaminants are ashed into volatile products which are removed through the roughing pump. As seen in the figure below (left), the radicals are carried out of the plasma into the main chamber by convection. In the chamber they react with all exposed surfaces, including the specimen if present. The plasma itself is confined to the Plasma Radical Source (PRS), which prevents ion bombardment damage to the instrument or specimen.



Cross-section of SEM chamber illustrates how the Evactron® Decontaminator removes hydrocarbons from the system. The plasma is confined to a small chamber on the left of the larger SEM chamber. Radicals flow through the SEM chamber; these are shown as convective streamlines. The radicals encounter and chemically etch contamination in the vacuum system. The products (CO_2, CO and H_2O) are removed through the Vacuum Exhaust. SEM chamber with Evactron® Decontaminator Plasma Radical Source (PRS) attached. An adaptor flange is used to mount the Evactron® Decontaminator to the SEM.

Evactron® Adapter Flanges – SEM Port to KF40

All dimensions are in millimeters
OD = Outside Flange diameter
ORID = O-Ring Inside Diameter
#H = number of mounting holes + symmetry
O-ring not included with Adapter Flange
The most common Adapter Flanges are shown

SEM chamber with Evactron® Decontaminator Plasma Radical Source (PRS) attached. An adaptor flange is used to mount the Evactron® Decontaminator to the SEM.

Cat No.	Description	Qty.
230090-01	FEI, 64 X 80, 50 ORID, 4H, OCTG, ASYM	each
230141-01	FEI, 100 OD, 75 ORID, 6H	each
230142-01	FEI, 100 OD, 72 ORID, 88 BC, 3H	each
230143-01	FEI, 90 OD, 60 ORID, 78BC, 3H	each
230153-01	FEI, 85 OD, 60 ORID, 76 BC, 3H	each
230154-01	FEI, 100 OD, 70 ORID 84.5 BC, 3H	each
230155-01	FEI, 64 OD, 38 ORID, 57 BC, 4H	each
230235-01	FEI, 70 OD, 33 ORID, 61 BC, 4H, PLUG, 1 PIECE	each
230335-01	FEI, 87 OD, 60 ORID, 74 BC, 3H	each
230350-01	FEI, 120 OD, 93 ORID, 109 BC, 6H	each
230351-00	FEI, 59 OD, 38 ORID, 52 BC, 4H, 1 PIECE	each
230359-01	FEI, 90 OD, 70 ORID, 80 BC, 3H	each
230006-01	HITACHI, 57 OD, 34.5 ORID, 50 BC, 4H	each
230320-01	HITACHI, 58 X 58, 24 ORID, 41.5 BC, 4H, PLUG, 1 PIECE	each
230568-01	HITACHI, 69 OD, 47.5 ORID, 4H	each
230001-01	JEOL, 64 OD, 40 ORID, 55 BC, 4H	each
230002-01	JEOL, 99 OD , 75 ORID, 89 BC, 4H, 38 (1.5") LONG NIPPLE	each
230002-02	JEOL, 99 OD, 75 ORID, 89 BC, 4H, 64 (2.5") LONG NIPPLE	each
230003-01	JEOL, 86 X 206, NO O-RING, 4H ASYM	each
230010-01	JEOL, 73 OD, 50 ORID, 64 BC, 4H	each
230011-01	JEOL, 74 X 90, OVAL O-RING, 4H, ASYM	each
230013-01	JEOL, 88 OD, 45 ORID,79 BC, 4H, ASYM, 90 LONG NIPPLE	each
230022-01	JEOL, 100 X 355, NO O-RING, 5H, ASYM	each
230023-01	JEOL, 72 X 86, OVAL O-RING, 4H, ASYM	each
230311-01	JEOL, 88 OD, 45 ORID, 79 BC, 4H, ASYM	each
230322-01	JEOL, 75 X 98 (ARCHED ON ONE SIDE), OVAL O-RING, 4H, ASYM	each
230325-01	JEOL, 154 X 204, RECT O-RING, 4H, ASYM	each
230664-01	JEOL, 95 OD, 71.5 ORID, 85.5 BC, 3H	each
230008-01	ZEISS, 55 OD, 30 ORID, 45 BC, 4H	each
230012-01	ZEISS, 64 X 64, 54 ORID, 57 BC, 4H	each
230014-01	ZEISS, 79 OD, 53 ORID, 70.5 BC 4H	each
230015-01	ZEISS, 84 OD, 54 ORID, 72 BC, 4H	each
230016-01	ZEISS, 70 OD, 45 ORID, 57 BC, 4H	each
230017-01	ZEISS, 113.5 OD, 46.5 ORID, 92 BC, 4H	each
230018-01	ZEISS, 64 OD, 38 ORID, 57 BC, 4H	each
230020-01	ZEISS, 82 OD, 41 ORID, 68 BC, 4H, PLUG	each
230034-01	ZEISS, 96 OD, 72 ORID, 86 BC, 4H, ASYM	each
230036-01	ZEISS, 62 X 62, 53 ORID, 71 BC, 4H	each
230037-01	ZEISS, 162 OD, 127 ORID, 149 BC, 6H	each
230038-01	ZEISS, 68 X 88, OVAL O-RING, 4H, SYMM	each
230039-01	ZEISS, 89 X 89, 72 ORID, 92 BC, 4H	each
230356-01	ZEISS, 100 OD, 60 ORID, 90 BC, 6H	each
230357-01	ZEISS, 90 OD, 66 ORID, 81 BC, 4H, ASYM	each
230358-01	ZEISS, 81 X 85, 4H, ASYM	each
230364-01	ZEISS, 85 x 85, 70 ORID, 92 BC, 4H	each
230366-01	ZEISS, 150 X 190, RECTANGULAR O-RING, 10H, ASYM	each

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Evactron® CombiClean™ System

- **Cleans SEM/TEM samples and SEM chambers from one desktop controller**
- **Stores samples and parts after cleaning**
- **Uses patented Safar TEM side loaders**

Decontaminate specimens and columns of SEMs and FIBs. The Evactron® CombiClean™ System combines onboard vacuum cleaning chamber and external PRS (Plasma Radical Source) control in one unified system.

- **Cleans SEM/TEM samples and SEM chambers from one desktop controller**
- **Stores samples and parts after cleaning**
- **Uses patented Safar TEM side loaders**

Innovative Design

Designed as a complete cleaning solution, the Evactron® CombiClean System features an integrated vacuum chamber for desktop cleaning samples and vacuum parts, as well as an external Plasma Radical Source (PRS) for Evactron® in-situ cleaning of E-beam instruments such as SEMs, FIBs, and other analytic instruments, by removing carbon contamination.

The system monitors operation of either PRS unit, has internal memory, and is designed for routine operation with minimal operator training. Onboard control allows for changing the cleaning modes between external and internal PRS with just the flip of a switch.

This system is compatible with rotary vane pumps without the worry of oil backstreaming. A dry nitrogen purge feature keeps specimens clean after a plasma cleaning, and a storage mode allows you to continue dry nitrogen purging a sample while the external PRS is in use.

Specifications

The system features a microprocessor with embedded software to regulate a leak valve and control the chamber pressure by a MicroPirani gauge.

The microprocessor also regulates the RF power, has a clock to time the downstream plasma cleaning and nitrogen purging cycles, and records the operational and fault log.

Cleaning with the Evactron® CombiClean System may be setup from either the front panel or a remote computer.

VentDetect™ Technology

Compatible with rotary vane pumps without the worry of oil backstreaming

Dry Nitrogen purge feature keeps specimens clean after plasma cleaning

Storage mode allows continued dry nitrogen purging of samples while external PRS is in use

System monitors operation of either PRS unit

Onboard control allows for cleaning modes between internal and external PRS with just the flip of a switch

Wide Pressure Range

Ordering Information

Cat. No.	Description	Qty.
91000-17	Evactron® CombiClean™ System	each

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email: sgkcck@aol.com *or* stacie@ems-secure.com
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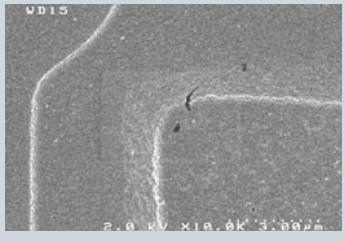
Chemistry of the Evactron® Decontaminator

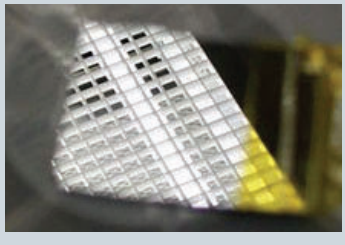
In low-power room air plasma, a large amount of the electron energy is distributed to vibrational excitation of oxygen and nitrogen molecules. Oxygen has a lower dissociation energy (5.1 eV) than nitrogen (9.7 eV), so these vibrational excitations are more likely to lead to oxygen molecule dissociation than nitrogen molecule dissociation. A small fraction of oxygen molecules will be dissociated by electron bombardment to form oxygen radicals, and these radicals will leave the PRS and go into the main vacuum chamber. Greater RF power will lead to a greater number of nitrogen and oxygen ions, which in turn will lead to the formation of secondary products, such as NO.

The decontamination process generally begins with hydride extraction (hydrogen atom removal) in the contamination which creates more reactive sites. These sites undergo additional reactions by radicals, which break down hydrocarbon contamination into volatiles.

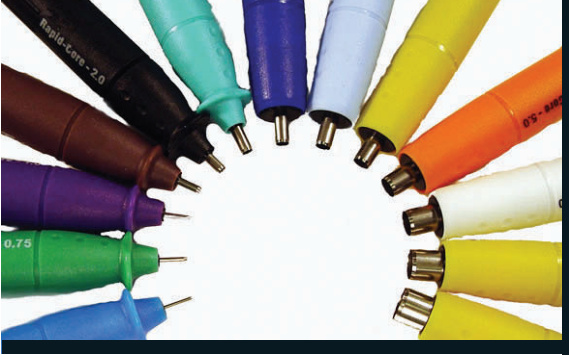
For fluorocarbons, the C-F bond oxidation reaction is very endothermic and these compounds are non-reactive. In silicon and on most metals a stable oxide layer has already formed on the metal and Evactron® oxidation will not penetrate this oxide layer.



Removed contamination by Evactron cleaning results in no black square.



Carbon buildup removed from same EUV mirror shown above.




Efficient, safe, fast, precise, and...***revolutionary***

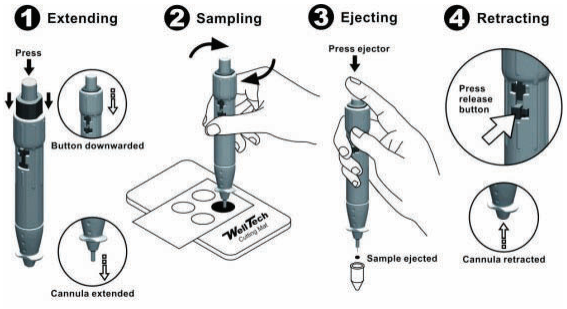
EMS-Core Sampling Tool

EMS-Core is an all new revolutionary multi-purpose sampling tool, designed with retractable cutting cannulla for easy operation. Efficient, safe, fast and precise, the EMS-Core consists of a razor sharp stainless steel cutting tip, designed to cut, retrieve and store cored samples from source materials such as skin, tissue, gels, paper, cloth, leaves, paint chips, films or other thin, soft substrates. The EMS-Core is well known and recommended as the special DNA sampling tool and is ideal for forensic and laboratory sampling purposes. Each EMS-Core is individually packaged and ethylene oxide sterilized.

Features

- **Pen-like Actuator mechanically extends the cannulla from the protective casing**
- **Self-contained Plunger effortlessly ejects the tissue sample out of the tip**

* Please retract cutting cannula when not in use



Specifications

Sizes:	0.35, 0.5, 0.75, 1.0, 1.2, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0 & 8.0mm
Material:	PP - body, 304 stainless steel - cutting cannula (tip)
Packaging:	Each piece in individual pouch, 25 pcs per box, 500 pcs per carton
Sterilization:	EO (Ethylene Oxide)

Ordering Information

Cat.#	Type (mm)	ID (mm)	OD (mm)	Wall thickness (mm)	Qty
69039-03	0.35	0.33	0.63	0.15	each
69039-05	0.5	0.50	0.80	0.15	each
69039-07	0.75	0.77	1.07	0.15	each
69039-10	1.0	0.96	1.26	0.15	each
69039-12	1.2	1.2	1.5	0.15	each
69039-15	1.5	1.5	1.9	0.20	each
69039-20	2.0	2.0	2.4	0.20	each
69039-25	2.5	2.5	2.9	0.20	each
69039-30	3.0	3.0	3.4	0.20	each
69039-35	3.5	3.5	3.9	0.20	each
69039-40	4.0	4.0	4.4	0.20	each
69039-50	5.0	5.0	5.5	0.25	each
69039-60	6.0	6.0	6.5	0.25	each
69039-70	7.0	7.0	7.5	0.25	each
69039-80	8.0	8.0	8.5	0.25	each

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