

Living up to Life

Leica
MICROSYSTEMS

Leica EM ACE

New Generation Coaters





Leica EM **ACE** Coaters

your advanced coating experience...

Developed in cooperation with leading scientists, the new generation of ACE coater covers all the requirements for your sample preparation needs, from coating to freeze fracture.

Open the door to explore new coating capabilities.

Our philosophy is simple, 'Produce a coating layer easily, fast and reliably, to achieve the best image of your sample in the electron microscope'.

Discover the features

- › One touch coating
- › Small footprint
- › Cryo upgrade
- › Customized configurations
- › Intuitive operation
- › Fully automated

Leica EM **ACE** – A coater family to cover all your needs

COATING TECHNOLOGY

Coating of samples is required in the field of electron microscopy to enable or improve the imaging of samples. Creating a conductive layer of metal on the sample inhibits charging, reduces thermal damage and improves the secondary electron signal required for topographic examination in the SEM. Fine carbon layers, being transparent to the electron beam but

conductive, are needed for x-ray microanalysis, to support films on grids and back up replicas to be imaged in the TEM. The coating technique used depends on the resolution and application. The Leica EM ACE coater family provides the perfect solution for every application.

The Leica EM ACE one-touch coating systems are available in two versions: The Leica EM ACE200 Low Vacuum coater for general SEM and TEM analysis and the Leica EM ACE600 High Vacuum coater for the highest resolution TEM and FE-SEM analysis. The ACE600 instrument is easily upgraded to a cryo-coater including vacuum cryo transfer.

The instruments are fully automated for the easiest operation. Their compact design and small footprint saves lab space whilst delivering operational ergonomomy. Protocols can be shared as the touch screen interface supports a multi-user environment. The flexibility of the ACE coaters allows individual systems to be configured to your laboratories exact needs.

Bigger area

Better layer

Best results



LESS...

- › Human interaction time and expert knowledge
- › Investment costs
- › Footprint
- › Sealing surface - one door only
- › Cleaning effort - removable door, chamber shielding and shutter
- › Operator effort - easy push-fit connectors - no tools required

...IS MORE

- › Intuitive touch-screen and automated process run
- › Customized configuration with hardware and software upgrades
- › Lab space
- › Visibility, easy loading and fast vacuum build-up
- › Effective coating to free your working time
- › Homogenous coating, accurate layers and reproducible results

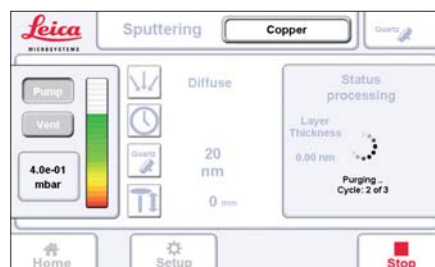
Simple adaptation

Smallest footprint

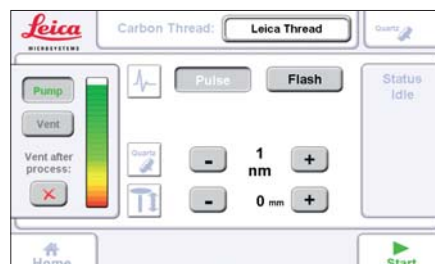
Smoothest operation

Sputtering process

Purging the chamber to be followed by sputtering 20 nm copper at a pressure of 8×10^{-2} mbar (option diffuse).



Carbon thread evaporation waiting to start. When "Start" is pushed, threads will be degassed and 1 nm carbon will be deposited. Table is on the defined zero position and the instrument is kept under vacuum after finishing the process.



Touch-screen Operation Leica EM ACE600 with Leica EM VCT100



Leica EM ACE200

Sputter and Carbon Thread Coating for perfectly reproducible results



Design W. Hölbl

The Leica EM ACE200 is a high quality desk-top coater designed to produce homogeneous coatings of conductive metal or carbon as required for electron microscopy.

The fully automated instrument can be configured either as a sputter coater or a carbon thread evaporation coater. Or, if preferred, the Leica EM ACE200 can combine both methods with interchangeable heads on the one instrument. Additional options include:

- › Quartz crystal measurement – for reproducible layers
- › Planetary rotation – for even distribution of coating material on fissured samples
- › Glow discharge – to make TEM grids hydrophilic
- › Exchangeable shielding – for easy cleaning

Small Coaters – Big Features ...

A new era of carbon evaporation

Carbon layers, up to 40 nm thick, are defined and accurately deposited using a unique software-controlled, pulsed evaporation procedure in combination

with continuous thickness monitoring (quartz measurement). Carbon layers are therefore highly reproducible and smooth.

Easy cleaning with removable door, shutter and internal shielding, source and stage.



Leica EM ACE600

High Vacuum Coating – configure your system – we build the coater you need



Design W. Hölbl

The Leica EM ACE600 is a versatile high vacuum film deposition system, designed to produce very thin, fine-grained and conductive metal and carbon coatings for the highest resolution analysis, as required for FE-SEM and TEM applications.

This fully automated table-top coater includes an integrated oil-free pumping system, quartz crystal film thickness measurement and three axis motorized stage (rotation, optional tilt and height).

The Leica EM ACE600 can be configured for the following methods:

- › Sputtering
- › Carbon thread evaporation
- › Carbon rod evaporation (with an option for thermal resistance evaporation)
- › e-beam evaporation
- › Glow discharge
- › Leica EM VCT adaptation for cryo-coating, freeze-fracture, double-replica, freeze-drying and environmental transfer with the VCT Shuttle

Angled sources and integrated rotation for larger, more evenly coated surfaces. Up to two sources can be configured to your laboratories needs.

3-axis motorized stage control – stage adjustment without breaking vacuum.

Integrated quartz measurement centered in the stage for perfectly reproducible results.



Leica EM ACE600 with Leica EM VCT100

Not only a coater – cryo options and VCT connection for the Leica EM ACE600

The Leica EM ACE600 outfitted with a Leica EM VCT100 (vacuum cryo transfer system) is the ideal solution for contamination-free cryo-SEM sample preparation with complete environmental control. Cryo stage and room temperature stages are interchangeable once the coater is cryo-configured. With the VCT100 configuration, the ACE600 connects to other VCT-outfitted instruments such as glove boxes, SEMs and the Leica EM FC7T.

- › Transfer under controlled environment (vacuum and temperature)
- › Cryo pump for higher vacuum
- › Temperature-controlled stage for freeze fracture, sublimation and freeze drying
- › Fracturing knife with motor-driven height adjustment
- › Scalpel for basic fracturing
- › Double replica release



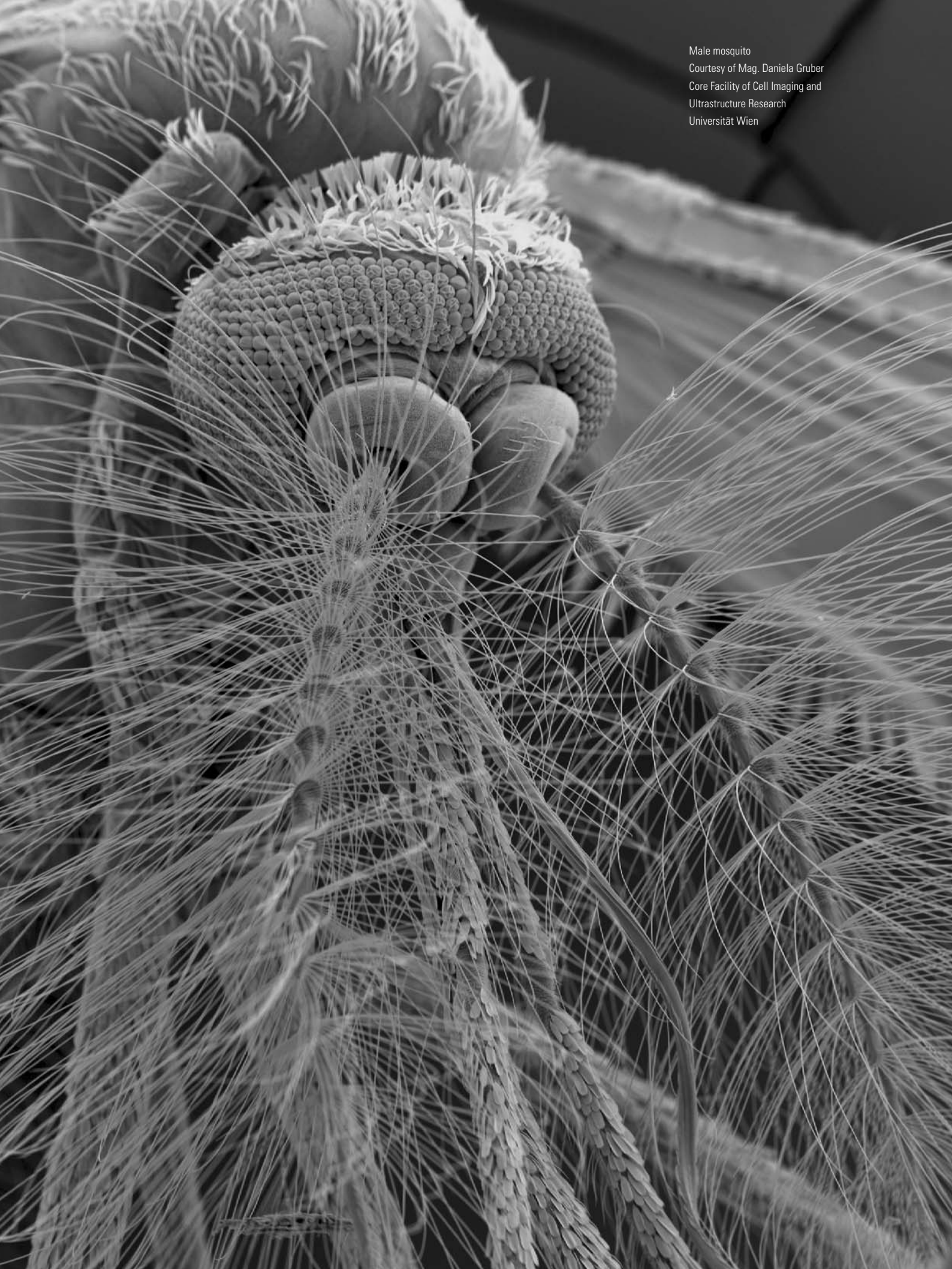


- › LED light illuminates the whole coating chamber to comfortably observe the processes
- › Assisted parameter setting and automated run of the whole coating cycle
- › Vacuum cryo transfer – sample is always under cryo-conditions

Freeze Fracture, Freeze Etching and Freeze Drying

Freeze fracture includes a series of techniques that reveal and replicate internal components of organelles and other membrane structures for examination in the electron microscope. Freeze etching removes layers of ice by sublimation and exposes membrane surfaces that were originally hidden.

Freeze drying, also known as lyophilization, removes water from a frozen sample under high vacuum conditions (sublimation). The result is a dry and stable sample which can be imaged in the electron microscope.



Male mosquito
Courtesy of Mag. Daniela Gruber
Core Facility of Cell Imaging and
Ultrastructure Research
Universität Wien



SEM and TEM Workflows

Leica Microsystems offers a complete range of solutions for EM sample preparation. The new Leica EM ACE coaters perfectly enhance these workflows.

Only if each step of sample preparation is of the highest quality, can optimum results be obtained from a high resolution electron microscope.

WORKFLOW

Tissue Processing –
Leica EM TP



Automated tissue processing for fixation and dehydration.

Critical Point Drying –
Leica EM CPD300



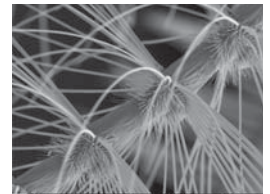
Automated critical point drying for extremely well preserved sample structures.

Coating –
Leica EM ACE200 and ACE600



Automated coating for reproducible, thin and conductive layers.

Imaging and analysis



Antenna of male mosquito (Gold sputter coating), SEM.

WORKFLOW

High Pressure Freezing –
Leica EM HPM100, Leica EM PACT2



Superior cryo fixation to observe aqueous biological and industrial samples near to native state.

Cryo Ultramicrotomy –
Leica EM UC7 with EM FC7



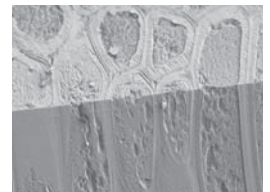
High quality ultrathin sectioning/planning for light, electron, and atomic force microscopy examination.

Coating –
Leica EM ACE600 cryo outfit



High vacuum coating in conjunction with Leica EM VCT100 (vacuum cryo transfer) system for the finest metal and carbon layers.

Imaging and analysis



Mouse kidney (Platinum cryo-sputter coating), Cryo SEM.

