

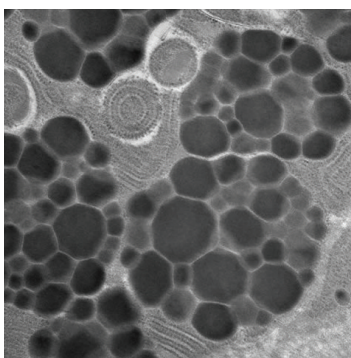


the first-of-its-kind, compact, easy to use,
stand-alone glow discharge system

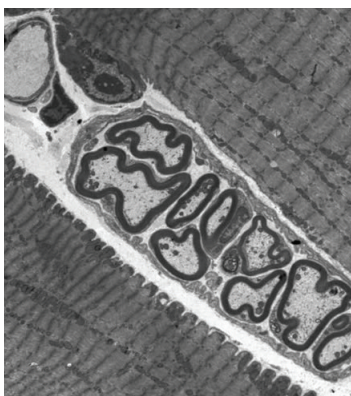


EMS GloQube™

Glow Discharge System for TEM Grids



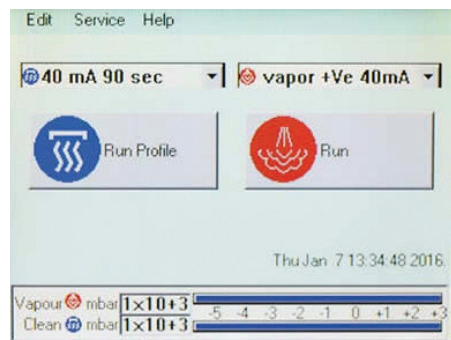
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Key Features

- 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



EMS GloQube™ Start-up Screen

Front Cover Micrographs:

Top: *Pseudomonas fluorescens*

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

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

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Rapid, reliable results...

EMS GloQube™

Glow Discharge System for TEM Grids

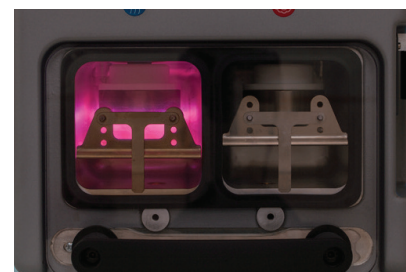
The EMS GloQube™ is the first-of-its-kind compact, easy to use, stand-alone glow discharge system.

Unique Dual Chamber Processing, Safe Handling of Reagents

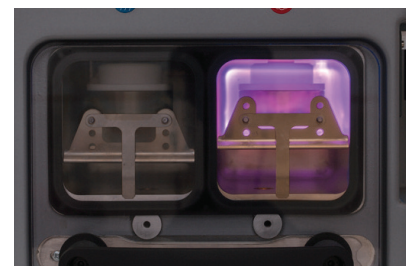
The GloQube has two independent vacuum chambers: a clean chamber, designed for applications requiring hydrophobic/hydrophilic conversion, typically using air as the process gas; and a vapor chamber, designed for use with reagents such as methanol and alkylamine. With operator safety firmly in mind, reusable 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



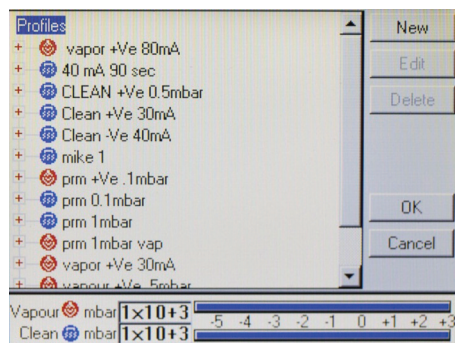
Vapor Delivery System

Glow Discharge Process

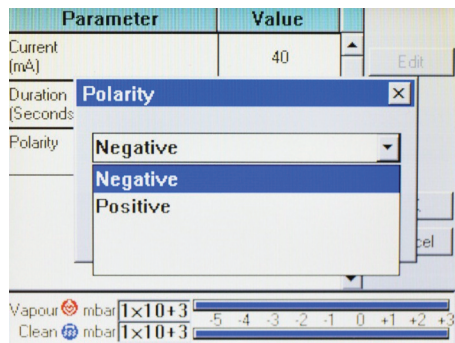
Surface State	Charge	Atmosphere	Typical Applications
Hydrophilic	Negative	Air	Carbon coated TEM grids
Hydrophilic	Positive	Air – with magnesium acetate post-treatment	Nucleic acid adhesion to carbon films
Hydrophilic	Positive	Alkylamine	Proteins, antibodies and nucleic acids
Hydrophilic	Negative	Methanol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

Touch Screen Control – Rapid Data Input, Simple Operation

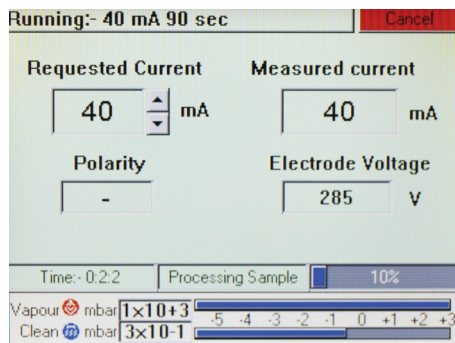
The intuitive touch screen allows multiple users to rapidly input and store preferred process "recipes". Typical default glow discharge protocols are loaded as standard. Additionally, help files and useful maintenance data such as system on time and time since last clean are readily available to the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



Stored Profiles



Selecting a New Profile



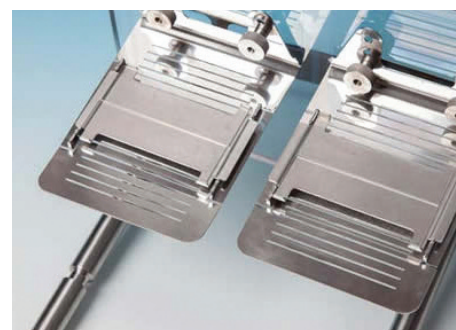
A Typical Process Run

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.

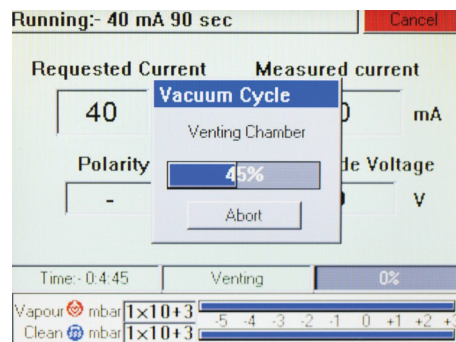


Easy Sample Loading



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.



Pumping Cycle

EMS GloQube-D and Optional Pfeiffer DUO 6 Rotary Pump



EMS GloQube™

Glow Discharge System for TEM Grids

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 requirement	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 m³/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



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 m³/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

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