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PROBLEM SOLVED

Desk Sputter and Carbon Coater – DSCR



DSCR

Desk Sputter and Carbon Coater

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Disclaimer

The components and packages described in this document are mutually compatible and guaranteed to meet or exceed the published performance specifications. No performance guarantees, however, can be given in circumstances where these component packages are used in conjunction with equipment supplied by companies other than VacTechniche Ltd.

Desk Sputter and Carbon Coater DSCR

The desk SEM coater model DSCR is a compact coating system enabling both sputter and carbon coating. This system is able to sputter noble metals such as gold (Au), palladium (Pd), platinum (Pt), and gold/palladium (Au/Pd), as well as thermal evaporation of different carbon sources (Fiber or rod) to coat on samples with non-conductive or poorly conductive surface for electron microscopy imaging or other applications.



The device is a rotary pumped coater configured for DC sputtering and carbon fiber (Thread) or carbon rod coating with interchangeable heads in one instrument.

Since sputtering deposition and carbon evaporation are standard mechanisms for increasing the surface electrical conductivity of the scanning electron microscope (SEM) samples to prevent charge buildup during the imaging process, DSCR is a versatile machine for SEM sample preparation.

The full-automatic sputter and carbon coating processes allows easy, precise, and repeatable performance.

DSCR can be equipped with a water-cooled sputtering cathode which make it suitable for long time deposition.
The maximum size of substrates in this model could be 4 inches.

Features

Hardware:

- **Two-stage, direct drive rotary vane pump 6 m^3/h (can be ordered or purchased separately)**
- **80 W DC switching power supply for sputtering**
- **500 W, 0-25 A pulsed DC power supply for carbon fiber evaporation**
- **1.2 kW, 0-100 A DC power supply for carbon rod evaporation (Optional)**
- **Quartz crystal thickness monitor with precision of 1 nm and resolution of 1 Å**
- **One 2-inch magnetron cathode**
- **Electronic venting valve**
- **Sample rotation, height, and tilt adjustable**
- **Planetary sample holder (Optional)**
- **Electronic shutter**
- **Easy-to-change specimen stages (Rotation stage as standard)**
- **Two-year warranty**
- **CE conformity**

Automation:

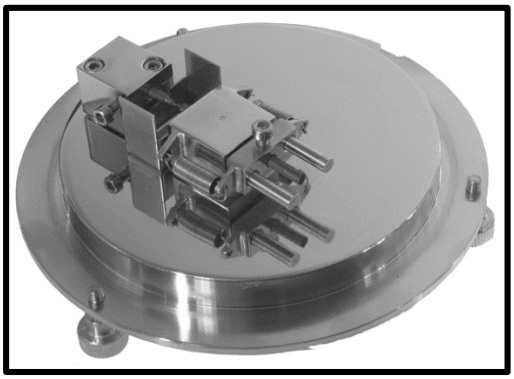
- **Intuitive touch screen to control the coating process and rapid data input**
- **User friendly software, updatable via network**
- **Precise control over coating rate to achieve finer grain structures**
- **Semi-full automatic sputtering**
- **Semi-full automatic carbon fiber/rod deposition process**
- **Repeatable and programmable sputtering and carbon coating process in the automatic mode**
- **Manual or automatic timed and thickness sputtering deposition**
- **Records and plots coating parameters graphs**
- **Storing coating recipes for repeatable depositions**

Pulsed Carbon Fiber Evaporation



The DSCR coater is able to perform pulsed carbon fiber evaporation. Short pulses provide more controlled deposition and significantly reduces the amount of debris associated with traditional carbon deposition.

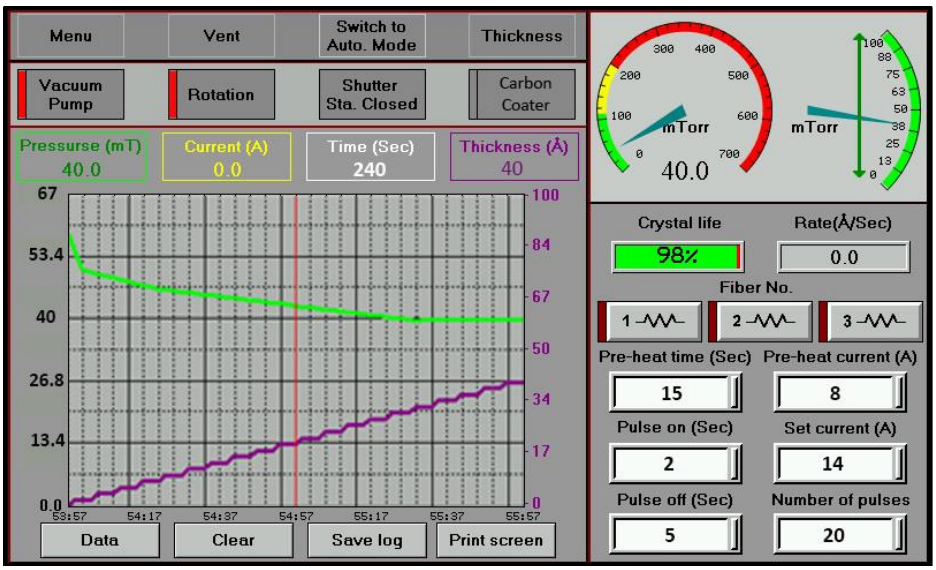
Carbon Rod Evaporation (Optional)



The DSCR could be equipped with carbon rod evaporator head (Optional). For this case an external 0-100 A high current power supply should be used instead of the internal high current power supply which is designed for carbon fiber evaporation.

Touch Screen Control

DSCR, the desk SEM coater, is equipped with a 7" colored touch-screen panel and full automatic control using a user-friendly software to control and adjust the deposition process data. The vacuum and coating sequence information can be observed as digital data or curves on the touch screen. The last 300 coatings information is saved on the history page.



Sample Holder Stages

The DSCR can be equipped with different sample stage configurations depending on the user requirements. The standard sample stage is rotatable with adjustable height and angle and can be changed easily. The rotary planetary sample stage is a good choice for uniform coating of porous specimens (Optional).



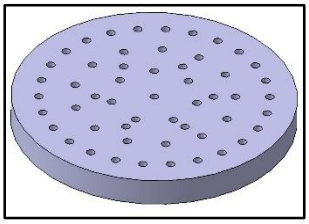
Standard Sample Stage

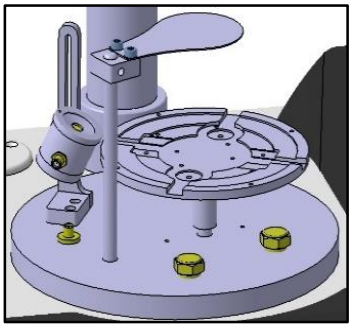


Rotary Planetary Sample Stage

Newly Designed Sample Holder

A new 4-inch rotating sample holder with an optional gear offset is designed for the system to increase the deposition area and the number of coating stubs in a run.





Applications

- **Deposition of carbon and metals for SEM, FE-SEM, EDX, and TEM sample preparation**
- **Conductive layers**
- **GLAD sputtering**
- **Glow discharge plasma (Optional)**
- **TEM grid plasma treatment for improved hydrophilicity (Optional)**

Note

For sputtering of oxidizing metals, please see the DSCT (Turbo-pumped desk sputter and carbon coater).

Specification

- **Suitable for deposition of noble metals, carbon fiber (thread), and rod (Optional)**
- **Automatic control of the cathode's temperature to protect the lifetime of the magnets**
- **Real-time plot of coating parameters**
- **Max. power consumption: 2 kW**

Options and Accessories

- **Head and external power supply for carbon rod evaporation**

- **Quartz crystal sensor**
- **Planetary sample rotation stage**
- **Spare cylindrical vacuum glass chamber**
- **Sputtering targets**
- **Sealing gaskets**
- **Glow discharge plasma treatment**
- **Carbon fiber thread source**

Detailed Features

Dimensions	520 × 480 × 370 mm (H × W × D)
Weight	42 Kg
Vacuum Chamber Dimension	Borosilicate Glass, 170 mm Dia× 140 mm Height
Display Screen	7" Diagonal (16:9) 800×480 High Color- Graphic TFT- LCD
Data Transfer	USB Port – For Transferring the data and graph to PC
Sputter Target Dimension	1 Disc, Diameter ranging 50-56 mm, Thickness 0.1~3 mm (The preferred thickness is less than 1 mm. For ferromagnetic targets thickness should be less than 0.5 mm.) ✓ A silver target is installed on the cathode when delivered.
Carbon fiber	Carbon fiber thread diameter: 0.8 mm (Thicker fiber is not recommended)
Carbon rod	Carbon rod diameter: 3.2 mm
Sample Holder Dimension	Standard holder with 60 mm Dia., can contain: • 23×9.6 mm stubs or • 14×12.7 mm stubs or • 5×19 mm stubs Sample holder with 100mm Dia. with Offset gear box can contain 40×12.7 mm stubs (optional)
Chamber's Lid	Made of Aluminum/SST containing one sputter cathode or triple carbon fiber (thread) holder or a rod holder (optional).
Thickness Sensor	
Specification	Crystal thickness gauge with sensor, Silver coated crystal quartz, oscillator
Resolution	±1 Angstrom
Accuracy	±1 nanometer
Vacuum Equipment	
Vacuum Pump	Two-stage rotary vane (can be ordered or purchased separately)
Vacuum gauge range	10^{3}-1×10^{-3} Torr
Final Vacuum	30×10^{-3} Torr (depends on the vacuum pump)

Process	
Sputtering	Continuous Sputtering, Time, and Thickness dependent
Carbon Coating	Pulsed and Flash mode carbon fiber coating
	Pulsed mode carbon rod coating
Glow Discharge Plasma (Optional)	• TEM grid plasma treatment • Enhancing surface hydrophilicity
Service and other Information	
Gas	Argon as process gas with %99.999 purity
Control of Argon supply	Electronic leak valve
Electric Power Supply	DC: 80 W switching DC power supply (Sputtering process) HC: 24V, 20A (Carbon fiber evaporation) HC: 12V, 100A (Carbon rod evaporation)
Shutter	1 piece
Electrical Inlet	Inlet: 220-240V or 110V, 50/60Hz *

*** Single-phase AC power with appropriate earth connection is required.**