

HIGH VACUUM SPUTTER COATER AND CARBON/THERMAL EVAPORATOR - DSCT-T



The High Vacuum Sputter Coater and Carbon/Thermal Evaporator – DSCT-T is designed as a versatile instrument for Scanning Electron Microscope (SEM) sample preparation.

It features three interchangeable heads, allowing it to function as a sputter coater, carbon coater, and thermal evaporator in one unit. This system is capable of depositing a wide range of materials, including gold (Au), platinum/palladium (Pt/Pd) alloy, silver (Ag), chromium (Cr), tungsten (W), iridium (Ir), and more.

APPLICATIONS

- **Scanning Electron Microscopy (SEM)** – Provides high-quality conductive coatings to prepare non-conductive samples for detailed imaging.
- **Field Emission SEM (FE-SEM)** – Produces ultra-fine, uniform films required for advanced surface analysis.
- **EDS/WDS Analysis** – Delivers contamination-free coatings ideal for precise elemental and compositional studies.
- **Transmission Electron Microscopy (TEM)** – Enables thin carbon films for specimen support grids and aperture cleaning.
- **Electron Backscatter Diffraction (EBSD)** – Creates stable conductive coatings that enhance diffraction pattern clarity.
- **Thermal Evaporation Applications** – Supports deposition of metals with low evaporation temperatures such as Au, Ag, and Al, useful in thin-film sensors, optical components, micro/nanoelectronics, and solar cell research.

- **Thin Film Research** – Facilitates the deposition of noble metals, carbon, tungsten, chromium, and other challenging materials with controlled thickness and fine grain size.
- **Porous and Fragile Samples** – Provides uniform coatings with optional planetary rotation stages to protect delicate structures.
- **Academic and Research Laboratories** – A versatile dual-mode system suitable for teaching, training, and advanced multi-application research environments.

FEATURES

- High Vacuum Turbomolecular Pump rated at 90 liters per second (manufactured by Leybold)
- Choice of either a Two-stage Rotary Vane Pump or diaphragm pump as a backing pump
- Full range vacuum gauge (manufactured by Leybold)
- Carbon fiber evaporation head
- Carbon rod evaporation head
- Thermal evaporation head
- Pulsed or flash carbon fiber coating modes
- Quartz crystal thickness monitor with a precision of 1 nanometer and a resolution of 1 angstrom
- Intuitive touchscreen interface for controlling the coating process and easy data input
- User-friendly software that can be updated via network connectivity
- Precise control of the coating rate to achieve finer grain structures in the sputtering process
- Capability for manual or automatic timed and thickness sputtering
- GLAD (Glancing Angle Deposition) Sputtering capability
- Plasma Cleaning functionality
- Ability to record and visualize coating parameter graphs

- Equipped with an electronic shutter
- Easy-to-change specimen stages, with standard rotation or planetary rotation options
- Covered by a two-year warranty
- Worldwide coverage by both public and product liability insurance in case of any property damage or personal injury resulting from the use of Vac Coat systems.

Carbon Evaporation of DSCT-T

The mini-sized coating system, model DSCT-T (DSCT with Thermal Evaporator), is capable of carbon coating to produce uniform thin films on various surfaces using carbon fiber (or optionally, a carbon rod). By passing an electric current through the carbon fiber in either pulsed or flash mode, carbon evaporation is deposited onto the sample. This process effectively reduces the amount of debris typically associated with traditional carbon deposition methods.

Desk Sputter CoaterDesk Sputter Coater

Thermal Evaporation

The DSCT-T, Sputter Coater, and Carbon/Thermal Evaporator, come equipped with a thermal head designed for the evaporation of metals with low evaporation temperatures, such as gold, aluminum, silver, and more. This thermal head serves a dual purpose, allowing for the deposition of these metals and facilitating the cleaning of TEM (Transmission Electron Microscopy) apertures.

The thermal evaporation process accommodates a variety of applications. For instance, it can be used in the fabrication of metal films, production of thin-film sensors, manufacturing optical components, and serving the needs of the nano and microelectronics industries, as well as solar cell applications.

Sample Stages

The DSCT-T offers the flexibility of various sample stage configurations to cater to user-specific requirements. These sample stages are designed to be rotatable and adjustable in height, providing ease of use and adaptability. For achieving uniform coating on porous specimens, the option of a sample planetary rotation system is available and highly recommended.

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THEORY & METHOD

Furthermore, the thermal head of this High Vacuum SEM Coater can also be utilized for cleaning TEM and SEM apertures. Equipped with a Turbomolecular Pump, this coater is capable of producing high-quality uniform films with fine grain sizes. These attributes make it suitable for specimens that demand high-resolution and high-quality characterization, including FE-SEM, EDS/WDS, TEM, and EBSD.

The DSCT-T, known as the Sputter Coater and Carbon/Thermal Evaporator, comes with a 2" magnetron cathode, a high voltage switching DC power supply for sputtering, and a high current power supply for carbon evaporation and thermal evaporation. It is a valuable tool for research and various thin film applications in fields such as micro and nano electronics

and sample preparation.

TECHNICAL SPECIFICATIONS

- Ultimate Vacuum: Less than 7×10^{-7} torr
- Precise control of sputtering rate to achieve finer grain structure
- Automatic power control for sputtering independent of pressure
- Real-time plotting of coating parameters
- Capability to record and generate coating parameter graphs
- Convenient transfer of curves and deposition process data via the USB port to a PC
- Equipped with an electronic shutter
- Vacuum chamber with dimensions of 170 mm OD x 140 mm
- Suitable utilities: 220V-240V, 50/60HZ, 16A
- Shipping Weight: 42 kg

Options and Accessories

The Desk Sputter Coater – DSCT-T offers a range of options and accessories to enhance its capabilities:

- Carbon evaporation heads for both fiber and rod carbon
- Thermal evaporation head
- High current power supply
- Quartz crystal sensor
- Planetary sample rotation system
- Spare glass chamber
- Sputtering targets
- Choice of Carbon Fiber or Carbon Rod
- Sealing gaskets

- Thermal evaporation sources (boat/basket)



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