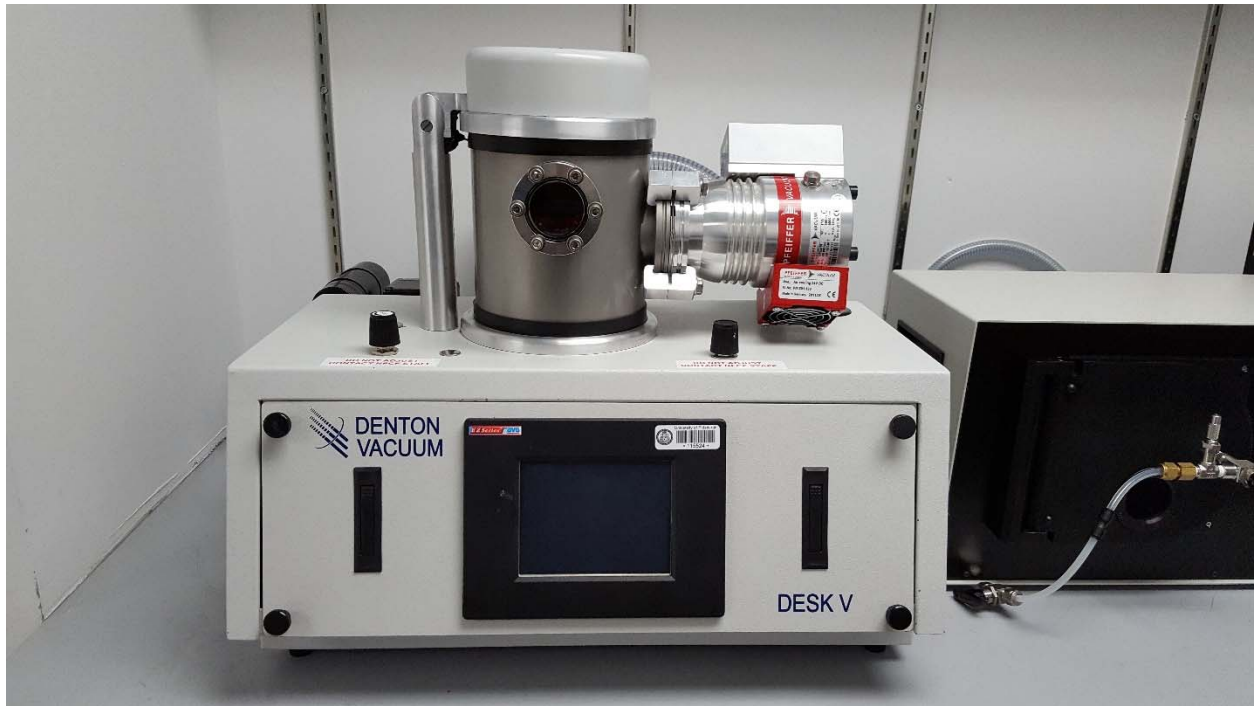


University of Pittsburgh
NanoScale Fabrication and Characterization
Facility

Denton Desk V TSC Sputter Coater
User Guide



This tool is designed to provide a thin conductive coating of a few monolayers on nonconductive samples to allow analysis in a SEM. The system is not designed to deposit thick layers for materials research and should not be used for thick layers.

Denton Vacuum Desk V TSC Au/Pd Sputter Coater Operation

Procedure:

This tool is designed to provide a thin conductive coating of a few monolayers on nonconductive samples to allow observation in a SEM. The system is not designed to deposit thick layers for materials research and should not be used for thick layers.

GETTING STARTED:

- 1) Log into the “Sputter Coater Denton” in your FOM account.
 - The introduction page on the system that includes the “System Start” button should be seen on the LCD.

LOADING:

- 2) The system should be found with the pumps off and vented to atmospheric pressure.
- 3) Carefully open lid 180deg.
 - The wires should slide easily, if not contact NCF Staff.
- 4) Place sample(s) onto the rotating stage plate.
 - Due to stage rotation during deposition, samples must be mounted securely.
- 5) Carefully close lid making sure cables are clear and are not pinched in the hinge.

PUMPING:

- 6) To start the system pumping; on the introduction page the LCD monitor select/press, "System Start", this will open the overview page, press "Manual Sputter" and then on the "Manual Sputter" page press "Mech Pump".
 - As the system starts to pump, hold the lid in place to make sure it seals. If you cannot get the lid to seal within 15 seconds turn the pump off and contact the NFCF Staff.
 - The 'Chamber Pressure'(vacuum) will be displayed starting at $\sim 7.6 \times 10^2$ Torr & will quickly start dropping from there. If this does not happen, turn off the pump & contact the NFCF Staff.

NOTE: NEVER ATTEMPT TO USE EITHER "MANUAL ETCH" OR "TIMED ETCH", THE SYSTEM IS NOT CONFIGURED FOR THIS AND SYSTEM DAMAGE IS POSSIBLE.

- 7) When the Chamber Pressure reaches 1.0 Torr, press "Turbo Pump" to start the turbo pump. The Chamber Pressure will further decrease to a minimum reading ($< 2 \times 10^{-5}$ Torr).
 - There is a major water desorption peak at $\sim 2 \times 10^{-5}$ Torr. If moisture is a concern for your sample the vacuum should be pumped to at least 2×10^{-5} Torr and allowed to outgas at that pressure. If moisture is not a concern, then 5×10^{-5} Torr should be sufficient.

NOTE: If necessary, the system pressure can go as low as $\sim 5 \times 10^{-6}$ Torr after several more hours of pumping. This may require pumping overnight.

COATING:

- 8) Select "Screens" to go back to the screen menu page and select "Timed Sputter".
 - 9) The "Deposition Process Set Point" should be reading 5×10^{-3} Torr.
 - A "Sputter Set Point" (current) of 20mA with a "Process Time" of 20sec is usually adequate to allow SEM Imaging of most samples. In some cases, the current and/or time may need to be increased.
- NOTE: The current should never exceed 35mA and the time should never exceed 100sec.**
- 10) Select "Vent After Sputter Enable" in order for the chamber to be automatically vented after the sputter cycle.
 - 11) Select "Timed Sputter Enable" to start deposition process.
 - 12) Select "Overview" to monitor the progress of the deposition process.
 - 13) After the deposition process is finished the system will vent automatically (the vent cycle takes 10 min).

UNLOADING:

- 14) Carefully open the lid 180°
The wires should slide easily, if not contact NCF Staff
- 15) Remove your samples
- 16) Carefully close lid making sure cables are clear and are not pinched in the hinge
- 17) Log out of the Sputter Coater Denton in your FOM account