

GENERAL PROCESS AND OPERATION SPECIFICATION

Cressington 108 Manual Sputter Coater

I. SCOPE

- a. The purpose of this document is to describe requirements and basic operating instructions for the Cressington 108 Manual Sputter Coater that coats thin conductive layers of gold on non-conductive SEM samples.

II. SAFETY

- a. Be sure that you are trained and signed off to use this equipment.
- b. If you are unsure about any procedure or indication while operating this equipment be sure to contact a staff member or trainer for assistance.
- c. If you encounter any issue, please notify or email the staff.

III. APPLICABLE DOCUMENTS, MATERIALS AND REQUIREMENTS

- a. Thickness estimate table is provided in Appendix A
- b. Front and back panel maps

IV. OPERATION

- a. If the chamber is under vacuum, then vent the chamber by rocking the vent valve on the top plate.



Vent Valve

- b. Load stub mounted samples onto the coater sample table and then close the lid.
 - i. Adjust table height if necessary.
- c. Rotate the gas control knob fully clockwise (closed) on the front of control box.



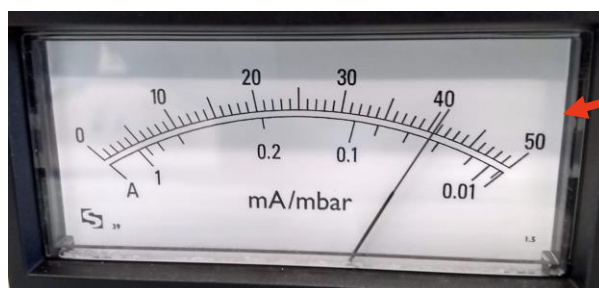
Gas Control Knob

- d. Open the valve on the Argon gas supply at rear of machine.



Argon gas valve

- e. Flip the Power switch located on the front panel of the control unit to the on position.
- i. The switch will glow red when on. The pump will automatically start to pump down the chamber.
 - ii. Apply decent force to the lid to ensure a seal is made when pumping. Verify lid is closed.
- f. Wait until the chamber pressure is less than 0.04 mbar.



Lower scale denotes pressure in mbar and upper scale denotes current in mA

- g. Rotate the gas control knob counterclockwise until the chamber pressure is 0.4 mbar.
- h. Allow Argon to flow at this pressure for 30 seconds.
- i. Rotate the gas control knob clock to a pressure of 0.06 mbar.
- j. Press and hold Pause and use the up/down buttons to adjust the timer on the digital display.
- i. **IMPORTANT:** Sputtering for more than 200 seconds will damage the tool.
- k. Press Test to check the sputtering current.
- i. Adjust the sputtering current using the rear panel knob to be between 20-40 mA (clockwise to increase, counterclockwise to decrease).
- l. Press Start to begin sputtering.
- m. Once complete, turn the gas control knob fully clockwise to shut off Argon flow.
- n. Close the Argon gas supply valve.
- o. Leave the main unit on for a minute to ensure the chamber gets free of process gases.
- p. Switch off the Power on the front panel.
- q. Vent the chamber by rocking the vent valve on the top plate.
- r. Lift top plate to remove samples.
- s. Close lid and turn on power switch to start pumping (1 min).

- t. Turn off power switch to turn off pump.
- u. Fill out logbook.

V. QUALITY

- a. The thickness of deposition is based on process time, power, table height, and gas pressure. Any of these parameters can affect coating thickness.

VI. SIGNATURES AND REVISION HISTORY

- a. Rev A - Mitchell Roselius, original author of this document
- b. Rev B - Dr. Prithvi Basu, added images

Approvals:

Technical Manager Signature: Sandra G Malhotra

Date: 1 Feb 2024

Revision History:

Revision	Author	Date
Original Issue	Manouchehr Teimouri	03/05/2018
Rev A	Mitchell Roselius	1/20/2021
Rev B	Prithvi Basu	2/1/2024
Rev C		

APPENDIX A: Thickness Estimate Table

Results were compile using a Gold target with Argon gas.

Working distance measured from sample table to target.

All thickness values are approximate and are intended for reference only. Actual results may vary.

30 mm WORKING DISTANCE									
	0.02 mbar			0.05 mbar			0.08 mbar		
	20 sec	40 sec	60 sec	20 sec	40 sec	60 sec	20 sec	40 sec	60 sec
20 mA	12 nm	24 nm	36 nm	10 nm	21 nm	31 nm	7 nm	14 nm	21 nm
30 mA	17 nm	35 nm	53 nm	16 nm	33 nm	50 nm	13 nm	25 nm	38 nm
40 mA	22 nm	48 nm	67 nm	25 nm	51 nm	77 nm	19 nm	39 nm	57 nm
50 mm WORKING DISTANCE									
	0.02 mbar			0.05 mbar			0.08 mbar		
	20 sec	40 sec	60 sec	20 sec	40 sec	60 sec	20 sec	40 sec	60 sec
20 mA	7 nm	13 nm	20 nm	4 nm	9 nm	14 nm	3 nm	5 nm	7 nm
30 mA	9 nm	20 nm	30 nm	8 nm	16 nm	24 nm	5 nm	10 nm	14 nm
40 mA	17 nm	33 nm	50 nm	11 nm	22 nm	34 nm	8 nm	15 nm	23 nm
70 mm WORKING DISTANCE									
	0.02 mbar			0.05 mbar			0.08 mbar		
	20 sec	40 sec	60 sec	20 sec	40 sec	60 sec	20 sec	40 sec	60 sec
20 mA	4 nm	7 nm	11 nm	1.3 nm	2.7 nm	4.2 nm	0.9 nm	1.9 nm	2.8 nm
30 mA	6 nm	12 nm	18 nm	2.9 nm	5.8 nm	8.7 nm	1.7 nm	3.5 nm	5.3 nm
40 mA	7 nm	15 nm	23 nm	4.6 nm	9.4 nm	14 nm	2.6 nm	5.3 nm	8 nm

APPENDIX B: Front and Back Panel Maps

