

Emitech K675x User Instructions

For the Micro-Electronics Laboratory

At

University of Notre Dame

Department of Electrical Engineering

Operation instructions: (Press “Stop” to end the process at any step)

1. Log into the logbook and the machine.
2. Power “ON” the Emitech. (Power switch on Right rear of machine)
3. Turn both the Argon tank and the regulator output valve to on by 1 turn.
4. After the system has started and came to the main menu, press “Start” to Run when Ready.
5. At prompt, choose “Sputter Coat” and press “Enter”.
6. At prompt select “Head C” and press “Enter” for sputter coating.
7. When the display reads “Rough Pumping Chamber” press “Stop” to vent the machine.
8. System will start venting the machine to atmosphere and will take a couple of minutes.
 - a. Displayed on Screen: “Stopping Turbo”.
 - b. Displayed on Screen: “Purging Chamber”. (45 Sec)
 - c. Displayed on Screen: “Press a key to reset and continue”, press “Enter”.
 - d. Displayed on Screen: “Error: User aborted cycle”, press “Enter”.
9. Wait until the lid lifts easily and lift the lid to the open position.
10. Change “window” if needed, windows will be in the white box to the right of the machine.
11. To change target if needed:
 - a. Unscrew the outer ring of the holder while holding the target so it doesn’t fall out.
 - b. Change targets to needed material. (Targets kept in box to the right of the machine).
 - c. While holding the target, screw on the outer ring of the target holder.
 - i. Center target in holder as you tighten the outer ring.
12. Remove “FTM cap” if needing to do FTM measurements. (Film Thickness Monitor)
13. Insert samples onto the table.
14. Allow lid to close gently.
15. Change Parameters as needed. (See tables on pages 2 & 3)
16. Press “Start” button when prepared to do your sputtering.
17. Choose “Sputter Coat” at prompt and press “Enter” button.
 - a. Displayed on Screen: “Initializing Sputter Cycle”.
18. Choose “Heads” at the prompt. (If one head selected it will receive 1/3rd of the current).
19. Press “Enter” Button.
 - a. Displayed on Screen: “Testing Stage Speed”.
 - b. Displayed on Screen: “Closing Shutter”.
 - c. Displayed on Screen: “Rough Pumping Chamber”.
 - d. Displayed on Screen: “Purging Chamber”. (20sec)
 - e. Displayed on Screen: “Pumping to 5x10⁻¹”.
 - f. Displayed on Screen: “Improving Vacuum” (3 min 30 sec cycle)
 - g. Displayed on Screen: “Bleeding Gas” (20 sec cycle)
 - h. Displayed on Screen: “Cleaning Targets at 420mA”. (30 Sec)
 - i. Displayed on Screen: “Bleeding Gas into Chamber”. (5 Sec)
 - j. Displayed on Screen: “Coating Sample”.
 - k. Displayed on Screen: “Stopping Turbo Pump”.
 - l. Displayed on Screen: “Purging Chamber”. (45 Sec)
20. Vent process will take a couple of minutes.
21. Wait until lid lifts easily, and lift lid to open position.
22. Process is now complete and chamber should be open.
23. Remove samples and insert samples for second batch if needed.
24. Do steps #10 thru #24 for as many samples as needed.
25. Replace FTM cap when completed with Film Thickness Depositions.
26. Allow lid to close gently.
27. Press “Start” button to Run when Ready.
28. Choose “Vacuum Shutdown” at the prompt and press “Enter”.
 - a. Displayed on Screen: “Pumping to 1x10⁺⁰ mbar”.
 - b. Displayed on Screen: “You may now switch off power, at main power switch”, turn “Power” off at the back of the machine.
29. Close gas cylinder tank and Regulator output valve.
30. Clean up the workspace and replace all extra supplies.
31. Verify the logbook has been completely filled out.

Parameters

Deposition Type

Sputter Coat

Target type
Noble
Oxidizing

Sputter Current

Sputter Time

Pump Hold Enable (Required "No")

Pump Hold Time (do not adjust)

FTM

FTM Enabled

Terminate Value

Tool Factor (Tested Value: 2)

Material and Density

FTM Operating Mode (Required "Auto")

Auto
Manual

Miscellaneous

Enable Vac Shutdown (Required "Yes")

Use Turbo Pump (Required "Yes")

Stage Rotation

Vent Time (Required "45 seconds")

Appendix A – Default Settings:

Name	Menu	Default Value	Min. Value	Max. Value	Comments
Target Type	Sputter Coating	Oxidizing	Oxidizing	Noble	Usually Oxidizing
Sputter Current (mA)	Sputter Coating	375	0	450	
Sputter Time	Sputter Coating	00:30	00:00	03:00	
Pump Hold Enable	Sputter Coating	No	No	Yes	Required "No"
Pump Hold Time	Sputter Coating	08:00:00	00:00:00	08:00:00	Do not Adjust
Enable Vacuum Shutdown	Miscellaneous	Yes	No	Yes	Required "Yes"
Use Turbo Pump	Miscellaneous	Yes	No	Yes	Required "Yes"
Stage Rotate	Miscellaneous	Yes	No	Yes	
Vent Time	Miscellaneous	01:00	00:00	04:00	Leave at 00:45
Purge Time	Miscellaneous	00:15	00:00	04:00	
FTM Enabled	FTM	No	No	Yes	
Terminate Thickness	FTM	5.0	0.1	999.9	
Material Density	FTM	7.19 (Cr)	2.70 (Al)	21.45 (Pt)	Changeable
Tooling Factor	FTM	1.0	0.1	9.9	2 for our machine
FTM Operating Mode	FTM	Manual	Manual	Automatic	Leave in "Auto"

Appendix B – Tooling Factor:

Tooling Factor - 2