

# Operation Procedure for EVAP1 CHA Solution E-Beam Evaporator

## Start-Up and Loading

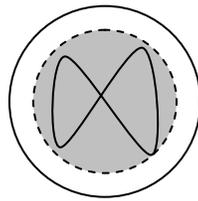
1. Initial State: Touch screen should indicate system is in automatic mode and should read "Pump Down Complete" unless another user just finished using it
2. Vent Chamber to load samples and source metals
  - a. Press F5 "Standby" on touch screen
  - b. Press Auto Tree" on touch screen
  - c. Press F3 "Auto Vent" on touch screen
  - d. Press "Yes" to vent
3. After venting is complete, press "Release Latch" to open the chamber door
4. Clean (vacuum) inside of chamber if necessary
5. Contact SMiF staff if crystal replacement is necessary (at ~70% crystal health)
6. Load or replenish source metals as necessary
  - a. **Load metal sources ONLY in the pocket locations indicated in the chart posted beside the evaporator**
7. Load substrates in the dome, using the jog button on the touch screen to rotate the dome
8. Before closing the door:
  - a. Verify gun rotation (using touch screen)
  - b. Verify all metals are in correct pocket locations
  - c. Verify shutter operation (using shutter button on Maxtek MDC-360) and leave shutter closed
  - d. Verify the mirrors are centered left to right in the window
9. Close the chamber door and press "Close Latch" on the touch screen
10. Press "Standby" on the touch screen
11. Press "Auto Tree" on the touch screen
12. Press F2 "Auto Pump" on the touch screen
13. Verify that pump sequence switches over to IG2 (chamber pressure reading) after a few minutes.
  - a. If IG2 switch over fails, wait a minute and then manually press the IG2 button
  - b. System will indicate pump complete when IG2 setpoint 1 is reached (1E-5)
14. The water flow to the system is now always kept on, so it is not user adjustable
15. Turn the key to the "On" position on the High Voltage module
16. Turn the power on to the high voltage power supply
17. Verify that all green lights are illuminated on the top row of the High Voltage and Gun Control modules

## Processing (Metal Deposition)

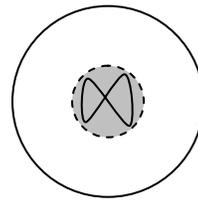
18. Create or revise desired process on the Maxtek MDC-360 (if needed)
19. Verify process materials and target thicknesses in desired process program
20. Press **Start** on the Maxtek MDC-360
  - a. Move cursor to the desired process
  - b. Press **Start** again
    - i. System should move to pocket location of first metal
    - ii. Confirm system states "soak rise"
21. Press **Abort** and then **Reset** on the Maxtek MDC-360
  - a. Maxtek screen should indicate "Process Ready"

22. Wait until desired chamber vacuum level is achieved and then press F1 "Auto Run" on the touch screen to start the deposition process.  
*Note: Deposition process will not start until IG2 setpoint 2 is reached (5E-6)*
23. When Auto run is started, the following should occur:
  - a. High voltage module is turned on and voltage reads 10kV
  - b. Gun control module is turned on
  - c. Maxtek program is started with first metal going into "soak rise"
24. Verify fixture rotation is 20 rpm on touch screen
25. As beam current ramps up, observe beam location and sweep amplitude and adjust if necessary according to following diagrams:

Beam path should form a figure 8 in the size indicated relative to the metal source size



Cr



Ag, Au, Co, Mo, Ni, Pt, Ti, Pd, Ge

*Do not adjust the sweep frequency*

26. Fill out a run sheet in the logbook during the deposition process

### **Unloading and Shut-down**

27. When the deposition process has been completed, the touch screen will display "Do you want to vent?"
28. Press "Yes" on the touch screen to vent the system
29. After venting is complete, press "Release Latch" to open the chamber door
30. Unload substrates from the dome, using the jog button on the touch screen to rotate the dome
31. Clean (vacuum) inside of chamber if necessary
  - a. **If Co or Ni were used, you must remove the sources when complete and clean the pockets and chamber thoroughly**
  - b. **The cryopump gate port (under the screen at the right front of the chamber) must be vacuumed after every run**
32. Close the chamber door and press "Close Latch" on the touch screen
33. Press "Standby" on the touch screen
34. Press "Auto Tree" on the touch screen
35. Press F2 "Auto Pump" on the touch screen
36. Verify that pump sequence switches over to IG2 (chamber pressure reading) after a few minutes.
  - a. If IG2 switch over fails, wait a minute and then manually press the IG2 button
37. Turn the key to the "Off" position on the High Voltage module
38. Turn the power off to the high voltage power supply
39. Complete any entries on run sheet in logbook