Temescal e-beam deposition machine

**Experienced User Operation Procedure**

This manual does not replace proper training and assumes that the machine is in proper working order and that users have been sufficiently trained to operate it with full understanding of processes and safety concerns. This manual is a short version of the full manual for those who are already very familiar with the basic operation of this machine. If something appears to be not functioning correctly, you must stop what you are doing and contact the primary system administrator for assistance.

**System Startup**

The machine must be started up and in standby mode before it can be used. This must be done by the system admin. The full startup process takes about 2-3 hours.

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### Basic Operational Procedure:

1. Check to see that the Nitrogen and Compressed Air utility valves are ON and tagged out.

2. Call up the computer screen out of screen saver mode and log in.
   a. Username = Recipe Select
   b. Password = Berkeley

3. Select Auto Menu button (bottom, center)

4. Select Vent PC button from Auto Select Menu (upper right)

5. Select Start button (bottom, left)

6. Chamber can be opened after reading of -10 or zero is displayed.

7. When dome can be opened, hit Stop button at bottom.

8. Then hit Abort button at bottom.

9. Open the dome and insert samples. Make sure they clear the hardware with a full rotation.

10. Close the dome.
11. Select Auto Menu button (bottom, center)

12. Select Pump button from Auto Select Menu

13. Select Start button

14. Auto Done will turn green indicating when Pump process is completed.

15. It will take about 20 min for the ion gauge to reach set point for processing. This of course depends on the chosen set point in the recipe.

16. Go back to Auto Menu.

17. Choose the Select button from the Auto Select Menu.

18. Choose Recipe file. Click Open.

19. Click Recipe button in the Auto Select Menu.

20. Turn on the power to the supplemental power box on the wall.

21. Hit the white reset button on the Simba2 power supply.

22. Then click Start.

23. Click Show Data Log Config button, check Disable Data Logging box, then Accept.

24. Then hit Start button again.

25. Hit Start Recipe in Data Logging window.

26. High Voltage will be turned on when ready.

27. Power will ramp up and Shutter will open when ready.

28. Deposition Control will start showing accumulation progress.

29. When target deposition reached, shutter will close.

30. Power will ramp down to zero.

31. “wait for source cool” will be displayed for some time.

32. High Voltage power will be shut off.
33. Gate Valve will close.
34. Sample Chamber nitrogen vent will open.
35. Dome pressure will drop to zero (-10).
36. "wait for vent time will be displayed" for some time after.
37. "waiting for atmosphere delay complete" will be shown
38. Vent Valve will close.
39. "waiting for full shutdown complete" will be shown.
40. "waiting for operator" message will be shown and Auto Done button will turn green.
41. Open the dome, remove samples.
42. If you will do more runs, repeat process steps 4-41.
43. If you are done, close dome, and go back to Auto Menu.
44. Click Pump button.
45. Click Start button.
46. Turn OFF the power to the supplemental power box on the wall.
47. Go back to Main menu.
48. Click on User Log Off
49. Shut off Nitrogen and Compressed Air lines. Leave water ON!!

It is very important that users never open any doors, covers, or try to gain access to the inside of the machine. A 10,200 Volt source is located just inside the front door and terminals are exposed. Even when the power supply shuts off the system remains charged at high voltages for substantial times. There is a reason there are interlocks everywhere and 5 separate emergency shut off buttons. This is not a machine to be trifled with.
When you log off the machine, it will be resting in a state where some system functions will remain on. Most importantly, the cryo pump will remain on and this requires building water for heat exchange. If the machine will not be used again for a couple of days or more, then the system needs to be brought down fully. Only the primary system operator can do this. So, when you are done with your run and have logged out, it is important that you contact the system administrator so that the machine can be shut down fully if needed. Please use the ‘DONE’ sign to indicate that you are finished.

If you encounter any problems while operating this machine or desire to use different materials or modify existing recipes, please contact the system administrator. These functions are not available to basic users.

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