

**Temescal FC-2000 Electron Beam Evaporator  
CORAL NAME = EbeamFP**

**STANDARD OPERATING PROCEDURE**

**Electron Beam Theory**

An electron beam is a stream of energetic, negatively charged particles whose kinetic energy is transformed into thermal energy upon impact. This stream of electrons can melt and evaporate any material provided the beam contains sufficient energy to make up heat losses associated with holding the material at high temperature. This vapor stream propagates from the evaporator (crucible) to the substrate (wafers located on the planetary dome) and condenses on it in the form of a thin film. Crystal monitors can sense the rate of evaporation and provide feedback to control the level of power to the source target material which, in turn, regulates deposition to the desired thickness predetermined by the user.

**SAFETY:**

1. Only users trained in the operation of the EbeamFP are allowed access to the system.
2. Avoid placing fingers or foreign objects between the door and the chamber edge while the lid is closing. Personal injury or damage to the machine could result.

**USER RESPONSIBILITY**

This equipment must be used in accordance with the instructions and information contained in this SOP. Be sure to follow the step by step instructions bellow. The equipment must be checked periodically. Any abnormality, parts that are broken, missing, plainly worn, distorted, or contaminated, should be promptly reported to the lab staff immediately, via CORAL.

**Operating the System**

1. Engage the machine in Coral
2. From the Monitor's main Screen:
3. Click on "*Current user logged on*" button
4. User Name: **USER** <Enter>      Password: **USER** <Enter>
5. Click on "*System* map" button

### **To Load your wafers:**

1. Click on "Auto menu" button
2. Click on "Vent PC" (Process Chamber)
3. Click on "Start"
4. Click on "System Map"
5. The system will automatically start the Process Chamber Venting Cycle. Wait for the Process chamber to vent, and then **GENTLY** pull it up all the way to the back.
6. Using a Lab vacuum hose, proceed to vacuum the Process chamber
7. Load your wafer making sure that ALL wafer spaces are occupied, if they are not, place dummy wafers as needed to fill the planetary.
8. Wipe the O-ring and the Lid sealing surface with Isopropanol (Isopropyl alcohol.)
9. GENTLY, close the PC lid.
10. Click on "Auto menu" button
11. Click on "Pump"
12. Click on "Start"
13. Click on "System Map" The system should reach 1.0e-6 in about 20 minutes.

### **Starting Your Run**

14. Click on "Auto menu" button
  15. Click on "Recipe" button on the Edit Area (upper left side of the screen)
  16. Click on "Select File" button
  17. On the "C"-Drive, Go to the "Recipes" Folder
  18. Click/open the file for the material you need to deposit (Al, Au, Cr, Ni, Pt, Ti)
  19. Open the recipe you are planning to use.
  20. Click on #2 "Deposition Step" button
  21. Click on "Edit step" button
  22. Click on "Next Page" button three (3) times.
  23. Go to "SI Final Thickness" parameter, and change it to the desired thickness you are looking for. (keep in mind that the value of this parameter is in kilo-Å)
  24. Click on "First page" button
  25. Click on "Save Step" button
  26. Click on "Close" button. (The recipe is now set to your needs)
  27. Click on "Select" button on the Auto Select Area (upper right side of the screen)
- A window will pop up. Select and Open your recipe.
28. Click on "Recipe" button on the Auto Select Area (upper right side of the screen) the button should change to green color.
  29. Click on "Start" button at the bottom of the screen.
  30. Click on "Show Datalog Config" button.
  31. In the "Run ID" box, enter your MTL-Name and general info on your process. Click *OK*.
  32. Click on "Accept" button.
  33. Click on "Start" button, and then click on "Start recipe" button.
  34. Click on "System map" button.

Your process will automatically run. The chamber will vent when the entire process is complete. Be patient; do NOT attempt to interrupt the process sequence, wait until it is finished.

### **To remove your wafers:**

35. Wait for the Process chamber to vent, *GENTLY* pull it up all the way to the back.
  36. Remove your wafers and place the Dummies-wafer back on the open slots.
  37. Using a Lab vacuum hose, proceed to vacuum the Process chamber
  38. Wipe the O-ring and the Lid sealing surface with Isopropyl. Close the PC lid.
  39. Click on the "*Auto menu*" button
  40. Click on the "*Pump*" button on the Auto Select Area (upper right side of the screen) the button should change to green color.
  41. Click on "*Start*" button at the bottom of the screen.
  42. Click on the "*Main*" button. Click on the "*User Log Off*" button.
- Disengage from Coral.