**Introduction**

E-beam evaporator is dedicated for approved metal deposition on silicon wafers or other compatible substrates. Some of the approved metals are provided for evaporation. *Important: These guidelines are not meant to be complete operating instructions. Do not attempt to operate the tool without proper training.*

**Features and Specifications**

Materials: Ti, Cr, Ag, Au, Ni, Al, Cu etc.
Automatic PLC operated vacuum control system with touch screen
Single and multilayer deposition
In-line safety interlocks
Four pocket e-beam sources (4cc pockets)
Substrate rotation
Cryo pump and roughing pump
Base vacuum 2 x 10^-7 Torr or better

**Safety and Precautions**

High Voltage (5 kV) power sources are present
Turn off HV power before venting the chamber or if there is an immediate danger
Operating Procedure

1. Sample Loading

   Please check that e-beam HV power supply (EB3) is **Turned OFF**

   1.1 To vent chamber, press [Vent] button on vacuum control panel.

   1.2 Wait ~ 2 minutes for chamber pressure to equalize. Open door latch

   1.3 Load samples on sample plate

      1.3.1 Do not use Scotch tape

      1.3.2 Load samples on the plate. Make sure samples are stationed above source shutter SS1.

   1.4 Exercise the shutters

      1.4.1 The shutter remote button should be released for local control

      1.4.2 Place shutters in closed position, and return to remote mode

   1.5 Check that the material(s) you want to deposit is in the correct position and that the material is at the correct level in the crucible.

      1.5.1 Set crucible to correct material position (1-Ti; 2-Cr, 3-Au, 4-Ni.)
1.6 Make sure there is no object shorting the HV copper wires which are running parallel inside the chamber. **Warning: Lethal voltage 5kV.**

1.7 Close Chamber
1.8 Press [Cycle] on vacuum control panel to pump down
1.9 Before leaving the tool unattended, make sure that the system crosses over to the high vacuum pump. The display will read “Fine Pumping” after the high vacuum
1.10 In cycle sequence the chamber should be pumped down to ~ 4x10-6 Torr or better

2 Deposition Thickness controller

2.1 Check for material crucible assignments (1-Ti, 2-Cr, 3-Au, 4-Ni)
2.2 Select material (1-Ti, 2-Cr, 3-Au, 4-Ni) for the process accordingly in the controller (density and z ratio for materials are already stored in the controller)
2.3 Enter thickness for the process in the controller

3 Deposition

3.1 Make sure system is pumped down to at least 2x10-6 Torr.
3.2 Turn on switch on e-beam HV power supply (EB3).
3.3 Press [Seal] and then [Process] on touch screen vacuum control panel to pump down in Process sequence. Wait until it displays “Fine pumping 2”
3.4 Press the red Run button on the Deposition Thickness controller to start deposition. Deposition will run in auto mode.
(similarly the next layer can be deposited by selecting another material and thickness for the process)

4 Unloading

4.1 **Important:** TURN OFF e-beam HV power supply (EB3).
**Warning: Lethal voltage 5kV.**
4.2 Wait 5 min for chamber to cool
4.3 Press [Seal] and [Vent]
4.4 Wait 2 min. Open chamber and unload sample(s)
4.5 Vacuum clean any loose deposits inside chamber
4.6 Close door and press **Seal** and then **Cycle** to leave chamber under vacuum.

Before leaving the tool unattended, make sure that the system crosses over to the high vacuum pump. The display will read “Fine Pumping”.