Oerlikon Ebeam Evaporator SOP short

4/22/2020



1. Transfer sample holder into process chambers:

- Log in FOM from general usage computer to access the tool software
- Go to the software and log in with "user1" and password "user1"
- Go to transport chamber page and click next to the p320 to "Venting" the chamber

User name:	user1
Password	Change



2. Prepare sample and load samples:

- For 4" wafer, the substrate holder has a ring to hold it. Loosen the screws and insert your wafer. Then tighten the screws.
- For small samples, Kapton tape can be used to load the samples.
- Place the substrate holder face down on the transport chamber table. The groove should fit in with the edge of the table



• Close the transport chamber door and tighten the latch knob a little





2.1 Loading sample:

- 1. Load the substrate holder back on the stage in transport chamber and make sure it properly sits.
- 2. Evacuate the transport chamber by clicking "evacuate" in "Pump system transport Module" page
- 3. Make sure Arm is at position sensor 2
- 4. Click "substrate inserted" at transport chamber at "Substrate table of Transfer chamber" page



- 5. Click "Table down". Table has to be down to enable the valve V270 "open".
- 6. Once the transport chamber vacuum is less than **E-5 mbar**, Visual check to confirm shutter is out of the way inside Ebeam chamber!, then open V270 valve.
- 7. Transfer the arm all the way to position sensor 3 VERY SLOWLY!! Moving too fast will result in substrate holder falling off the arm.
- 8. Go to PC2 (Ebeam process chamber page) and click "substrate up" on the "Substrate table" page.

9. Once the substrate is up, move the arm back to position 2 position sensor.

	Substrate table of process chamber 2	
UNIVEX 450B Machine Alarm Reports Settings Service	Actual State:	leybold vacuum
Overview Transport Process Chamber	Empty Empty	
Customer no.: Univ of North Texas Additional Machine Process Chamber PC 2	* ErrorMessage:	& Admir
B04 003		
	Executable Commands:	Automatic Mode
	RF On RF Off Heater On Heater Off Substrate Up	PCT
4 L		PC 2
	RF - Blas	
	Actual Scree	
Ar Ar (Ion Source)	Regulation Mode: Power	
8	PowerActual: 0 W PowerSetpoint: 0 W	Programm Prog 2
	Power Reflected Actual: 0 W Voltage Setpoint 0 V	Emission Current 0.00 A
A 281 A 286	Heating temperature	
Setpoint: 50 scam	Actual State: Failure	Discharge Current 0.00 A
Actual: 0.0 scom Actual: 0.0 scom	Actual 24 °C Setpoint 100 °C	Discharge Voltage 0 V
	Gain 2	
¥ V281 ¥ V286	TI 50 sec TD 5 sec	
	Substrate Shutter	
	Actual State: Closed	
Substrate stage RF - Bias	Substrate onsidion and rotation sneed:	
Position: Down Regulation Me		
Status: Empty 😓 Power Setpois	Rotation Speed: Stop Rotation	
Rotating Speed Setpoint: NoCom rpm 23 Power Actual:	So to Hand Over Position	
Heating Setpoint 100 °C Voltage Setpo		
Heating Actual	Goto Reference Position	
	Reset Drive	
Alarms: 0	Save Undo	26.00.20
		15:24:

- 10. Click "Close" the V270 valve.
- 11. Click "Substrate inserted"" on the "Substrate table" page.
- 12. Click "Shutter close".

3. Deposition Process

Utility connection:

- 1. Before deposition process, MAKE SURE TO TURN ON THE CHILLER!!
- 2. Push I/O to turn on the chiller.
- 3. Check the flow meters readings and ALL green lights underneath the readings should be ON!





Note: the cooling water flow limits are lowered to 3.5, 4.4, 1.8 due to chiller's capacity. **DONOT use substrate heater with this setting. Contact J.C. for instruction if heater is needed.**

4. Verify all the powers supplies needed are on and gas valves are on.



5. "Rotation Speed" at "Substrate table" page. The rotation will start automatically by choosing "4-6 rpm". **DO NOT click "start". It is for other function!!**

3.1 Ebeam Deposition Operation:

The Ebeam deposition control is through "SQC-310 Deposition Controller". It can do automatic single/multi-layer deposition by one or two Ebeam guns. User needs to setup their specific films in "Film Menu" and deposition setting in "Deposition Control". Then add the films into one "process menu". The SQC-310 manual is next to the system for user to reference to.





Main	Process Menu: Edit Process 3		
Screen	Layer	Film	
Prev	Layer 1.1	TITANIUM GLINI 1	
Menu	Layer 2.1	TITANIUM_GUN2_5	
Edit			
Insert New			
Сору			
Delete			

- 1. Once select correct process, Press "Start" at the main screen to start the auto process. The Ebeam remote will show the HV and emission current in "automatic". Steps showing on the controller during processing:
- 2. pocket rotation.
- 3. Rise 1, soak 1 and rise 2, soak 2
- 4. Shutter delay if added, deposition
- 5. Reach set thickness and deposition stopped and shutters closed.



To adjust the beam location:

- 1. Press "Menu/Quit" button on the handset
- 2. Joy stick (Left) to move down to "Set Data"
- 3. Joy stick (Left) to move to Right to "position"
- 4. Joy stick (Right) to move the beam position (very careful!!)

4. Retrieve the sample from process chambers

- 1. Click "substrate shutter open" on "Substrate table" page
- 2. Choose "Stop Rotation" if rotation is used.
- 3. Click "Go to handover position". The shaft for latching substrate holder rotates to hand over position. The icon became green.

Substrate table of process chamber 2	
Actual State:	
Empty	
Error Message:	
Executable Commands:	
Healer On Healer On Healer On	Substrate Op
Substrate Down Shutter Open Shutter Close Substrate ins	erted
RF - Bias	
Actual State: Off	
Regulation Mode: Power	
Power Actual: 0 W Power Setpoint: 0 W	
Power Reflected Actual: 0 W Voltage Setpoint 0 V	
Heating temperature	
Actual state: Failure	
Actual 24 °C Setpoint 100 °C	
Gain 2	
TI 50 sec TD 5 sec	
Substrate Shutter	
Adual State. Closed	
Substrate position and rotation speed:	
Rotation Speed Stop Rotation	Start
	Go to Hand Over Positio
	- Go to Reference Positio
	Reset Drive

- 4. If transport chamber pumps are off, evacuate the transport chamber first.
- 5. Visual check to confirm shutter is out of the way! If not, redo step 1.
- 6. Open the V270 valves.
- 7. Move the transfer arm into the process chamber and to engage position sensor 3.
- 8. Click "substrate down" in the "Substrate table" page. The shaft will lower to latch on the substrate holder stem.
- 9. Move the arm back to load-lock at position sensor 2 VERY SLOWLY!!
- 10. "Close" V270 valve
- 11. Click "Table up" at transport chamber to enable the "Vent" function.
- 12. Venting the transport chamber to retrieve the sample.
- 13. Put sample holder back and on the table.
- 14. Evacuate the transport chamber and wait until the pressure <E-4.

15. Turn off the transport chamber pumps by click "off" on "Pump system transport module" page.

5. Shut down procedures:

- 1. Turn off the chiller.
- 2. Turn off the Ebeam power supplies.
- 3. Go to general usage computer and log out FOM.