Standard Operating Procedure UHV E Beam Evaporator



Yale West Campus Cleanroom ywccleanroom.yale.edu 100 Cleanroom Core Facility 300 Heffernan Drive West Haven, CT 06516

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UHV Electron Beam Evaporator SOP

1. Sign-In

1) All users are requested sign in the logbook first. Log into your **FOM** account and reserve your time for the E Beam Evaporator.

S FOM Screen Lock	Yale Central Authentication Service Login required You may establish Yale authentication how in order to access protected services later. NetD:
Click here to login with NetID	Password:
Or Click here if you do not have a NetID	Warn me before logging me in to other sites.
Citick inere in you do not have a weath	Login
	Please note
	Before entering your NetID and password, verify that the URL for this page begins with: https://secure.its.yale.edu
	To protect your privacy, quit your web browser when you are done accessing services that require authentication.



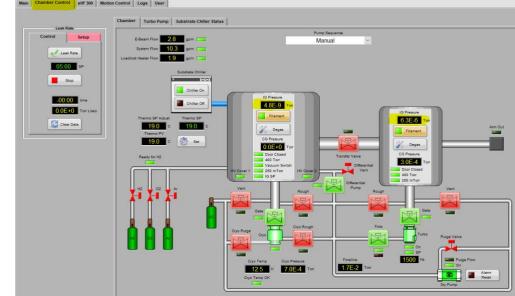
- 2) Turn on 454 EBeam.vi software distance if it is not on.
- 3) In User \rightarrow Login screen, type in User name and password.
 - User name: Manual, Password: manual

Main	Chamber Control	eHF 300	Motion Control	Logs	User			
Logir	Substrate Loa	d / Unload	Recipes					
							User Name	Current User Administrator
								· · · · · · · · · · · · · · · · · · ·
							Password	Permission Level Administrator
							Login Time	Login Remaining Time
							12:00:00	11:41:00
							E Login	J
							Edit Users	
								,
							Logout	

2. System check

1) Check Cryopump Temperature is around 12.3K ~ 12.8K. Report to manager if there is any issue.





2) Click Chamber Control panel, Check the main chamber pressure is below 5E-7 Torr.

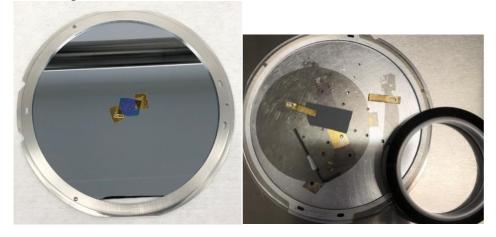
3) Check the cooling water flow rates as follows, The bars should be in green.



4) Check small load lock vacuum below E-6 Torr.

3. Mount Sample to Holder

- 1) There are two methods to mount your sample: Screws or Kapton tape.
- 2) Put your samples on substrate, prefer in the center region for better film uniformity.
- 3) If your sample is non-conductive, you can tight your samples using L-Key Screwdriver.
- 4) Mount your samples using Kapton tape. Please make sure to use as less tape as possible. If too much air is trapped by the tape, loadlock pumping time will be much longer.
- 5) Test whether samples can fall off or not.



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4. Load Substrate

Substrate Load / Unload Recipes				
Load Unload				
1) Make Sure Chamber Under High Vacuum	Chamber 4.7E-9 Torr			
2) Make Sure Transfer Valve is Closed (Red)	Transfer Valve Close			
3) Start Load Lock Vent	Load Look Vent 3.0E-4 Torr			
4) Load Wafer into Loadlock				
5) Pump Load Lock	Load Look 4.9E-6 Torr			
6) Wait for Transfer Vacuum OK LED	🔵 Transfer Vacuum OK			
7) Turn On Chamber Light	Light			
8) Home Substrate Rotation	Home ORdation Load Position			
9) Open Shutter / Unclamp Substrate	Substrate Shutter Open Unclamp			
10) Open Transfer Valve	Transfer Valve Open			
11) Move Wafer Transfer Arm In				
12) Clamp Substrate - Watch Transfer	Substrate Clamp			
13) Move Wafer Transfer Arm Out / Close Shutter	Substrate Shutter Close			
14) Close Transfer Valve	Transfer Valve Close			
15) Enable System Power Supplies in Electronics Rack	Power Supply Contactor			
16) Turn Off Chamber Light	Chamber Light			

First: Click User → Substrate Load/ Unload → Load.

1) Make Sure Chamber Under High Vacuum.

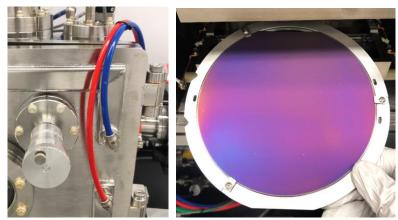
If <u>IDE+3</u> Torr is in dark, Click it <u>IDE+3</u> to see the vacuum level. If the Chamber IG is not turn on, click it and wait for 30 sec, and then click again. > Vacuum level should be better than 5E-7 Torr, wait until the vacuum is ready.

- 2) Make Sure Transfer Valve is Closed and in Red Color. Click the icon
- 3) Start Load Lock Vent by clicking
 - > You should hear the sound of pneumatic valve.
 - Check whether the vacuum value Vent 7.2E+2 Torr is increased.

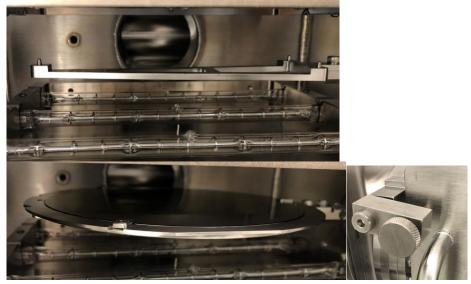
Load Lock Vent

- > The door should open automatically after 2 mins, and you can hear the leakage sound.
- 4) Load wafer into Loadlock.
 - Slowly open the door. Do Not bend the tubing.
 - ▶ Flip the substrate holder with your sample facing down.
 - Hold the substrate holder as following orientation: The end with One hole at left, the other end with two holes at right.

Close



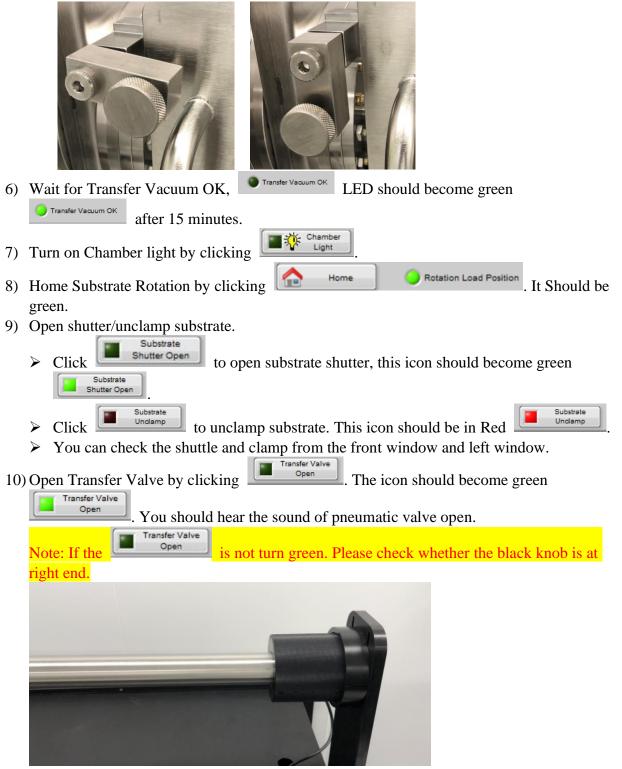
- > Put substrate holder on transfer arm with left side first.
- Slowly move the right side to find the two pins.
 Do not hit any lamp. Do not push the holder down.
- > Double check the holder is properly load With all three pins in the holes.
- \succ Close the door.
- > Tight screw gently. Never too tight.



- 5) Pump Load lock by clicking Load Lock Pump
 - > You should hear the sound of pump started.
 - > The locker will fall off.
 - > The vacuum should drop quickly.
 - Double check whether there is a gap in the window and chamber. Push the window to make sure it seals very well.

Load Look

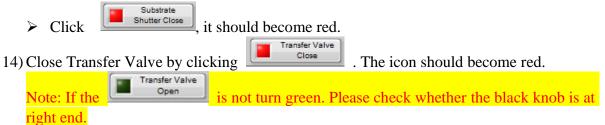
Pump



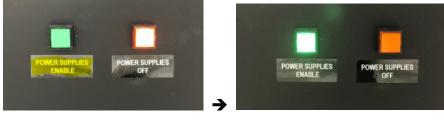
- 11) Move Wafer Transfer Arm In.
 - Slowly move the black knob to middle point.
 - > Check the location of your substrate from chamber front window and left-side window.
 - > Continue move the black knob to the end of arm where the stopper located.
 - > Check the location of your substrate from chamber front window and left-side window.



- 12) Clam Substrate Watch Transfer. Click Clamp , the clamp should push the substrate to stage.
- 13) Move Wafer Transfer Arm Out/Close shutter.
 - Slowly move the black knob out till the end. Make sure the black knob touch the end. Otherwise the Transfer Valve won't close.



- 15) Enable System Power Supplies in Electronics Rack by pressing the switch Control Chassis panel.
 - > Power supply Contactor LED should become green.



16) Turn off Chamber light by clicking



5. Ar Cleaning

Please make sure IG pressu	re	is ON.
Otherwise		



on PLC Control Chassis panel is in Green.

1) Make sure Power Supplies Enable 2) Click eHF 300 button to check the Ion Clean programs. No action is needed, just explanation.

ain C	Chamber Control	300 Motion Control	Logs User		
	Program 1 I	Data	Program 2	Data	
	0.0	Gas 1 (H2)	0.0	Gas 1 (H2)	Auto Gas 🗸
	0.0	Gas 2 (O2)	0.0	Gas 2 (O2)	
	40.0	Gas 3 (Ar)	20.0	Gas 3 (Ar)	Set Gas Mode
	50.0	Discharge Volts	100.0	Discharge Volts	
	2.00	Discharge Amps	2.00	Discharge Amps	Run Run
	2.00	Emission Amps	2.00	Emission Amps	
					Stop
	Program 3 I	Data	Program 4	Data	
[0.0	Gas 1 (H2)	0.0	Gas 1 (H2)	
	0.0	Gas 2 (O2)	0.0	Gas 2 (O2)	
	40.0	Gas 3 (Ar)	30.0	Gas 3 (Ar)	Help
	50.0	Discharge Volts	0.0	Discharge Volts	Help
	2.00	Discharge Amps	0.00	Discharge Amps	
	2.00	Emission Amps	0.00	Emission Amps	Remote Control

- (a) There are only 4 Ion Clean programs, users are not able to edit these parameters.
- (b) You can choose the best matched program and then optimize the etching time.
- (c) Program 1 is Ar etching, with 50V as Discharge Volts, 2A as Discharge Current, 40sccm Ar flow rate. (recommended)
- (d) Program 2 is Ar etching, with 100V as Discharge Volts, 2A as Discharge Current, 20sccm Ar flow rate.
- (e) Program 3 and 4 are for other gas etching.
- (f) Here Auto Gas is selected. This will adjust flow rate to reach Discharge Volts and Current.
- 3) Click User \rightarrow Recipes to find the program.

Main Chamber Contr	rol eHF 300 Motion Contro	DI Logs User			
Login Substrate	Load / Unload Recipes				
Da	tart Pressure Cool tart Pressure Cool 1.0E-7 Torr Infic ta Log Name PS C Cryce All U	pe Start Requires: mber Pressure < Start Pressure ed Stage Referenced D Tilt Referenced on Communication Isfer Valve Closed iontactor On o Contactor On sed Power Supplies On			
Main Chamber Control eHF 300 Motion C Login Substrate Load / Unload Recipes)				
Start Presure Start Presure UDE-72 Torr Data Log Name	Recipe Start Requires: Chamber Pressure < Start Pressure Cooled Stage Referenced GLAD TR Aleferenced GLAD TR Aleferenced PC contactor On Al Used Power Supples On Recipe Setup Run Order 54	stup	Ar Clean - P1	Step Label	
Expert CSV		SourceTime Substrate F		Rotation V 5.0 RPM	1
Clear Library Data	0 0.000 00	Chiller	19 c 00:01:00 Time		-
Step Actual	0 0.000 00 0 0.000 00 0 0.000 00 Papeat	100.00 V	Auto Gas	Shutter control only valid in timed mode. Inficon controls shutter for IBAD mode.	
Stopped	<	Delay	00:00:30 Time		-
0:10:56 Elapsed Time 1 Process 1 Active Layer	Cyde 1		te Shutter Open	Shutter control only valid for timed ion source operation.	-
Addre Esure 1 Addre Sourie 0.020 Addre Thildness (A) 6cute 1 0.00 0.00 Rate (Ax) 0.000 Rate (Ax) 0.000 Rate (Ax) 0.000 Rate (Ax) 0.000 Rote (Ax)	Step Recipe Name	¢			>

- 4) In the right side, you see the auto program of Ion Cleaning.
- ÷ 0 to select the one you need. 5) Click up or down arrow
- 6) Here 0 Ar Clean-P1 is recommended for Ar cleaning. These parameters are not editable.

(a) Subst	rate Rotation	Degrees Rotatio	n 🗠 <u>5.0</u> RF	^M Substrate Rotati	on is in 5 RPM.
(b)	hiller	19 c Chille	er is running at	19C to cool the st	tage.
(c)	elay 00:0	1:00 Time 1 min	delay before A	Ar etching.	

Timed ~ You can edit etching time on Recipe Setup shortly. Auto Gas

Auto gas mode is on to tune flow rate.



Program 1 is used, which is

The second delay. 30 Sec of Ar cleaning before

shutter to open.

Ion Source

(d)

(e)

50.0



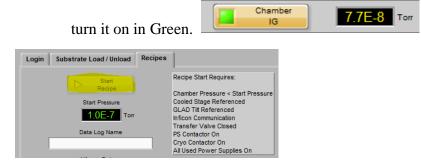
- 7) Recipe Setup. (Your action starts from this step)
 - (a) Click Setup in Recipe Setup.
 - (b) Click
 - (c) Click Step and type program you need. Here for Ar Cleaning type 0. This will use



(d) Click Ion Source Time and type in etching time, here shows 00:01:00. (60 sec)

		Paging Salus					
	Run Order	Recipe Setup	Setup				
Use Infi	con Thickness						
0	Step	Thickness (kA)	Ion SourceTime				
	0	0.000	00:01:00	^			
	0	0.000	00:00:00				
	0	0.000	00:00:00				
	0	0.000	00:00:00				
	0	0.000	00:00:00	~			
		Repeat					
	<			>			
		Cycle 1					
	Step Recipe Name						
Export CSV							
	Import CSV						
		Clear Recipe Data					

- 8) Start Etching.
 - Check Start Recipe.
 - ➤ If this is not on, click User → Substrate Load/ Unload, then click Chamber IG to



Main Chamb	er Control eHF 300 Mo	otion Control Logs	User		
Login Su	bstrate Load / Unload Re	cipes			
Loa	d Unload				
	1) Make Sure Chamber U	nder High Vacuum		Chamber IG	1.0E+3 Torr

9) Turn off Chamber Light if it is on.

Program Stop	Program Stop
Chamber Light	Chamber Light

10) Watch the etching or Recipe Activity shown at bottom left window.



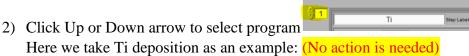
- 11) Watch the Ion process from the font window of main chamber.
- 12) When the process ends, the icon of Start Recipe becomes grey again because the vacuum level was above 1.0E-7 Torr. You need to wait for a better vacuum for next step.

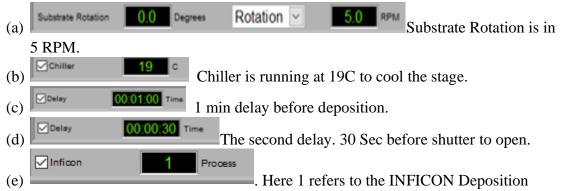
Main Chamber Control eHF 300	Motion C	ontrol Logs User
Login Substrate Load / Unload	Recipes	
Start Presure Start Presure 10007 Torr Data Log Name		Recipe Start Requires: Chamber Pressure < Start Pressure Cooled Stage Referenced GLAD TIR Referenced Inficon Communication Transfer Valve Closed PS Contactor On Cryo Contactor On All Used Power Supplies On

6. Metal Deposition (Auto Mode)

The deposition process is using an auto program. The program has been set at a constant deposition rate; User only needs to type in the thickness.

1) Click User \rightarrow Recipe.





Controller pragoram. Which has set all the parameters for Ti, including power range, ramp time, pocket number and so on.



	Ti	Step Label
Substrate Tilt	0.0 Degrees	
Substrate Rotation	0.0 Degrees	Rotation S.0 RPM
Chiller	<mark>19</mark> c	
🗹 Delay	00:01:00 Time	
lon Source	IBAD Auto Gas Program	Shutter control only valid in timed mode. Inficon controls shutter for IBAD mode.
🗹 Delay	00:01:00 Time	
✓ Inficon	1 Process	
Substrate Shutter	Open	Shutter control only valid for timed ion source operation.

- 3) Recipe Setup (Your action starts from here)
 - a) Click Setup in Recipe Setup

b) Click Clear Recipe Data

c) Type 1 in Step, which will use the program 1 of Ti. Similar to other metal deposition.

Run Order

- d) Type the Thickness value, here is 0.100 kA.
- e) Leave Ion Source Time as 0.

4) Change INFICON Deposition Controller to the corresponding program.

TINFICON Sec-310	TINFICON SQC-310 Descation Controller
Piect Mean Cr: Layer 1 of 1 Pari #: 1 Pracess Mean Stoped Pover (% vs. Time) Pracess Mean 900 100.0 State 25 37 50 Outper RetAn) 0.0 12 25 37 50 Outper RetAn) 0.0 -100.5 0.574 00 00	Marin Process Merul Scrol Processes with Knob A Edit 1. Th Edit 2. Comply Bellet 3. N Delete 7. cEmply Gopy 0. eEmply 1. cemply 1. cemply 1. cemply 1. cemply
REM TE	12. «Emply»

- a) Click Next Menu.
- b) Click Process Menu.
- c) Select process you need by scrolling the knob.
- d) Then click Select.
- e) Click Main Screen to go back. Your layer such as Cr: Layer 1 of 1 must be shown on screen.
- f) Click Next Menu again.
- g) Click Manual/ Auto button to change to Auto/Manual. This will change to Auto mode. This is very important.



- 5) Set Pocket Indexer Controller.
 - a) Touch the screen of Pocket Indexer Controller if it is dark.
 - b) Click Remote On button to switch to Remote mode.
 - c) Remote Control On should be shown. The final status is displayed as the right picture.

Note: Here the pocket in screen may be not the one you want, the program will automatically rotate when you start the deposition.



- 6) Choose correct pattern in Programmable Sweep panel.
 - a) Touch the screen if it is dark.
 - b) Click Select Pattern Select. Click Remote first if you didn't see
 - c) Click the correct Pattern.



d) One pattern is select, click Remote. The final status is shown below. It shows No Pattern.



- 7) Start Deposition.
 - Check Start Recipe.
 - ➢ If this is not on, click User → Substrate Load/ Unload, then click Chamber IG to

7.7E-8 Torr

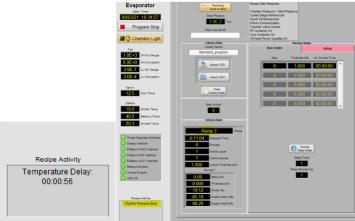
turn it on in Green.

➤ In addition, the vacuum level must be better than 1.0E-7 Torr.

IG

Login Substrate Load / Unload R	ecipes	I	
Start Recipe Start Pressure 1.0E-7 Data Log Name	Recipe Start Requires: Chamber Pressure < Start Pressure Cooled Stage Referenced GLAD Till Referenced Inficon Communication Transfer Valve Closed PS Contactor On Cryo Contactor On All Used Power Supplies On		
Main Chamber Control eHF 300	Motion Control Logs User		
Login Substrate Load / Unload	Recipes		
Load Unload			
1) Make Sure Chan	iber Under High Vacuum	Chamber IG	1.0E+3 Torr

- 8) Watch the Recipe Activity shown at bottom left window.
 - During the process, the power will increase to set point, but the source shutter is not open so we cannot see any rate.
 - The source shutter is open after soak 1 or 2, then the substrate shutter is open after 5 sec.



- 9) Click Next Menu→Next Graph→ Next Graph→ Next Graph to switch to big power window.
- 10) Watch the deposition process from the font window of main chamber.
- 11) When the process ends, the icon of Start Recipe becomes grey again because the vacuum level was above 1.0E-7 Torr. You need to wait for a better vacuum for next step.



7. Metal Deposition - Manual Mode (Recommended)

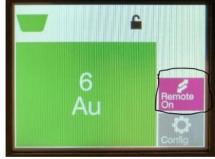
- 1) Change INFICON Deposition Controller to the corresponding program.
 - a) Click Next Menu and Next Menu.
 - b) Click Process Menu.



- c) Select process you need by scrolling the knob.
- d) Then click Select or press the knob.
- e) Click Main Screen to go back. Your layer such as Au: Layer 1 of 1 must be shown on screen.
- f) Click Next Menu again.
- g) Click Auto/Manual button to change to Manual/Auto. This will change to manual mode. This is very important.



- 2) Set up Pocket Indexer Controller.
 - a) Touch the screen if it is dark.
 - b) If it is in Remote Control On mode, click
 - c) Click the green region of panel.
 - d) Select the metal pocket, for example 6 Au pocket.
 - e) Wait until the pocket is done with rotation.
 - f) You should see the following picture. The metal you need must be shown.



- 3) Choose the correct pattern in Programmable Sweep panel.
 - a) Touch the screen if it is dark.
 - b) Click Remote if you did not see
 - c) Click Select Pattern
 - d) Click the correct Pattern by name.



4) Set Rotation for Cooled Stage.

	Main	Chamber Control	eHF 300	Motion Control	Logs U	ser
a)	Click Main		_			-
b)	Click	to start stage rotation	n in Coole	d Stage Rotation		
	Cooled Stage Rotation			-		
	5.0 RPM Actual 354.4 Degrees Actual					
	5.0 SP (rpm)					
	Operate Setup		12			
	Constant Rotation	Shutter	Open			
		QCN				
	Stop	Shutter	Open			

- 5) Quartz Crystal Setup. Double check Quartz Crystal 1 QCM1 is in green.
- 6) Check Chiller On for cooling stage.



Check Chiller On is in green and the Thermo SP Actual is 19C, shown below.

	Substrate Chiller
	60
	Chiller On
	Chiller Off
Thermo SP Actual	Thermo SP
19.0 C Thermo PV	<u>19.0</u> c
19.0 c	Set Set

- 7) Turn on E Beam voltage.
 - a) Click the Main menu window (right side)
 - b) In the right side, Clicking E-Beam On button to turn on 10kV.
 - c) Check the high voltage is increased to 10kV (or 9.99kV).

E Beem On E Edem E Edem E Edem HV HV		
Cubble		
Cr Remote Ni Al Sweeptridex Enable Requires:	E-Beam On	E Beam
HV Interlock On Sweep Remote On Indexer Remote On	E-Beam Off / Reset	Ону

8) Open E-Beam Shutter (In Main menu window, bottom left side) by clicking E-Beam Shutter open.



- 9) Manually increase power by pressing PWR Up button.
 - a) The power for gold at 1A/sec is around 7 ~ 9%, it may change depending on the volume of gold in crucible.
 - b) Slowly increase the power to 7% in 6min, 2~3 sec for 0.1% power increase. Note: Never increase power without any pause, big particles may spill out.
 - c) Check the beam spot during the power increase. Make sure it hits the center of gold pocket.
 - d) Maintain the 1A/sec deposition rate by tuning the power. Power should be no more than 25%.
- 10) Adjust e beam spot location and amplitude.
 - a) Check the e beam spot during the deposition, make sure it is in the center of crucible liner. Have to make sure the e beam hits the center of gold pellet, not on the bottom or sidewall of crucible.
 - b) Adjust the location if needed by clicking Pattern Pkt Setup Password: 1234
 - c) Select Lat first, then click + to move right, or to move left.
 - d) Select Long, Click + to move beam up, or to move beam down. Note: Lat means x direction, Long means y direction. Highlight Lat or Long, then

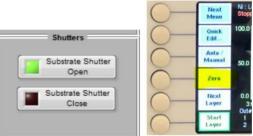


click + or -to change the value,

e) Click Ok. Check whether the e beam moves as you expected. Repeat again if needed.



- 11) Click Substrate Shutter Open and click Zero to start deposition.
 - a) Click Substrate Shutter Open button to open the substrate shutter.
 - b) Click Next Menu → Next Menu → Zero on INFICON Controller to set thickness to zero.



Wait for the deposition...... When deposition is done, take the following actions:

12) Click Substrate Shutter Close when the thickness is reached to your value.



- 13) Lower the Power relatively quick to Rate is ~0%, then slowly lower the power to 0% using **PWR Down** button. Every 3 sec for 0.1% down.
- 14) Close E-Beam Shutter by clicking E-Beam Shutter Close.



15) Turn off 10kV by clicking E-Beam off/Reset button. You should see the high voltage is decreased to 0 kV.



16) Turn off stage rotation by clicking Stop in Cooled Stage Rotation.



8. Unload Sample

- Before unloading the sample, check the load lock chamber, make sure it is empty inside.
- Click Power Supplies OFF on PLC Control Chassis panel to turn off power. Power supplies OFF LED should become red.

Chamber

- Make Sure Chamber Under High Vacuum. Click └└── use the vacuum level.
 ➤ Vacuum level should be better than E-8 Torr, wait until the vacuum is ready.
- 2) Make Sure Transfer Valve is Closed and in Red Color. Click the icon close if not red.

Chamber Light

Home

Make sure Transfer Arm is Empty and Pump Loadlock.
 Note: If transfer Arm is not empty, jump to step 13 to vent the load lock.

4) Wait for Transfer Vacuum OK, <u>Transfer Vacuum OK</u> LED should be in green.

- 5) Turn on Chamber light by clicking
- 6) Home Substrate Rotation by clicking in green.
- 7) Open Transfer Valve by clicking
 Transfer Valve
 Open
 Vou should hear the cound of programmatic valve to open

. You should hear the sound of pneumatic valve to open.

- 8) Open shutter and Move Wafer Transfer Arm In.
 - Click Substrate Shutter Open
 to open substrate shutter, this icon should become green
 - Slowly move the black knob to middle point,
 - > Check the location of your substrate from chamber front window and left-side window.
 - > Continue move the black knob to the end of arm where the stopper located.
 - > Check the location of your substrate from chamber front window and left-side window.

Transfer Valve

It Should be

Rotation Load Position

- 9) Unclamp Substrate Watch Transfer. Click , the clamp should release the substrate to transfer arm.
- 10) Move Wafer Transfer Arm Out.
 - Slowly move the black knob out till the end. Make sure the black knob to touch the end. Otherwise the Transfer Valve won't close.
- 11) Clamp Substrate/Close Shutter.
- Substrate Substrate Clamp Clamp ➤ Click , the icon should become green , the clamp should move up to stage. Substrate Substrate Shutter Close Shutter Close \triangleright Click the icon should become red to close substrate shutter. Transfer Valve Close The icon should become red 12) Close Transfer Valve by clicking Transfer Valve Close

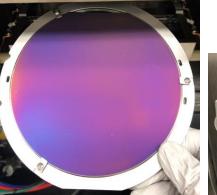
You should hear the sound of pneumatic valve to close.

- 13) Vent Load Lock by clicking
 - The door should open automatically after 2 mins
 Image: Contemporative relation in the leakage sound.
 Image: Contemporative relation in the leakage sound.
- 14) Remove Wafer from Load Lock.
 - Slowly open the door. Do Not bend the red and blue tubings.
 - ➤ Lift the substrate holder a little bit and take out from loadlock chamber.

Load Look

> Flip the substrate holder with your sample facing up.







- \succ Close the door.
- > Tight screw gently. Never too tight.

15) Pump Load lock by clicking



- > You should hear the sound of pump to start.
- ➤ The locker will fall off.



16) Turn off Chamber Light and PS Contractor in Electronics Rack.

- Click
 Click
 Chamber Light
 to turn off light.
- Press the POWER SUPPLIES OFF button

to turn off if the power is still on.

1) Make Sure Chamber Under High Vacuum	Chamber 8.1E-9 Torr
2) Make Sure Transfer Valve is Closed (Red)	Transfer Valve Close
3) Make Sure Transfer Arm is Empty and Pump Loadlock	Load Look Pump 1.5E-5. Tor
4) Wait for Transfer Vacuum OK LED	Transfer Vacuum CK
5) Turn On Chamber Light	Chamber Light
6) Home Substrate Rotation	Rotation Load Position
7) Open Transfer Valve	Transfer Valve Open
8) Open Shutter / Move Wafer Transfer Arm In	Substrate Shutter Open
9) Unclamp Substrate - Watch Transfer	Substate Undemp
10) Move Wafer Transfer Arm Out	
11) Clamp Substrate / Close Shutter	Substrate Substrate Shutter Close
12) Close Transfer Valve	Transfer Valve Close
13) Vent Load Lock	Vent Lost Lost Tor
14) Remove Wafer From Load Lock	
15) Pump Load Lock	Load Load Pump 1.5E-5 Tor
16) Turn Off Chamber Light and PS Contactor in Electronics Rack	Chamber Uppt Power Supply Contactor

9. Log Out System and FOM

- 1) Please check the vacuum level of loadlock, it must be smaller than 10-5 Torr.
- 2) Make sure POWER SUPPLIES OFF.
- 3) Remember to sign in logbook and record your metal thickness and deposition rate.
- 4) Log out FOM and **type the thickness of gold if you used gold.**