Standard Operating Procedure for the EMS Q150R ES Coating System

Version: 25 FEB 2022

1. Utility Requirements

a. **Electrical:** 120 VAC, 11 A

b. **Process Gas:** UHP-Plus Argon (99.9993% pure) supplied by a T-sized tank located next to the tool. The line pressure is regulated to 4 psig (28 kPa; 0.3 bar) at the tank. Before proceeding, ensure that the tank (not line) pressure is greater than 700 psig (5000 kPa). Do not proceed if the tank pressure is less than 500 psig. Notify cleanroom personnel if the tank pressure is low.

2. General Information and Precautions

a. The Q150R ES is a combination sputter coating and carbon/metal evaporation tool. Interchangeable inserts are provided for each process: one for sputtering and one for evaporation. See the separate *SOP for Changing the Process Head Insert* for details.

b. The Q150R ES uses a colored Status Indicator light at the base of the tool to display its current status. If it flashes red, there is an error; contact KUNF personnel immediately.

c. The Q150R ES is fitted with a quartz film thickness monitor (FTM) to gauge film thickness in real time. The quartz crystal requires periodic replacement; see the separate *SOP for Checking or Changing the Film Thickness Monitor Crystal* for details.

d. Stubs and adhesives are stocked in the metrology room with the SEM. Adhesives must be dry and set before using the sputter coater.

e. Do not maintain a plasma flame longer than 4 minutes, as this will damage the instrument.

3. Power On the Tool

a. Ensure that the Argon tank has sufficient pressure. See Section 1.b.

b. If the screen is off, power on the tool using the rocker switch on the back (right side).

c. After initialization, the home screen will be displayed. ”KUNF User” should be displayed at the bottom. If login is required, the password is “KUNF”

4. Mounting or Removing a Substrate in the Chamber

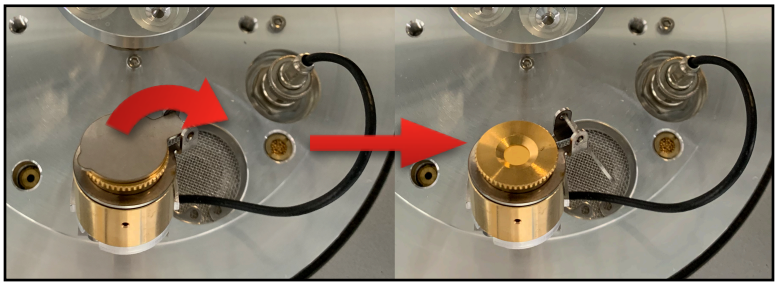
a. Press the **Recipes** button, find **Vent**, and then press the “play” icon (▶) on the right to start venting the chamber.

b. Once the chamber has vented, lift the gray process head.

c. Remove the glass cylinder and set it on a clean wiper. Do not set the glass cylinder on its side! Avoid touching the mating surfaces and rubber gaskets; wipe the surfaces clean with IPA if necessary. Do not apply vacuum grease to the rubber gaskets.

d. Mount or remove your sample(s) on the stage.

e. If you are running a sputter process that uses the FTM (see section 2.c), open the flap shown at right. Conversely, if you are removing your sample after an FTM process or are running a process that doesn’t require the FTM, close the flap.

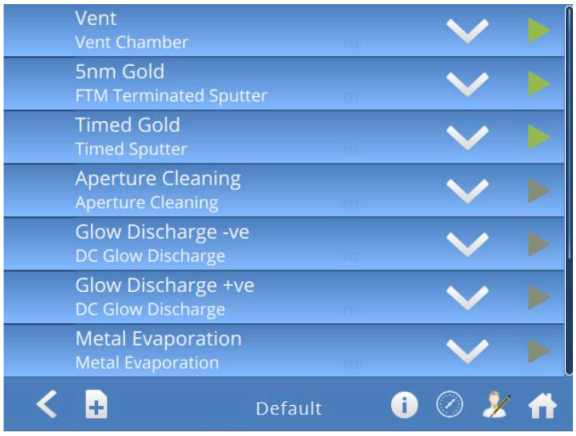


f. Replace the glass cylinder.

g. Close the sputter head lid. Press it down firmly so that it seals when the vacuum pump starts.

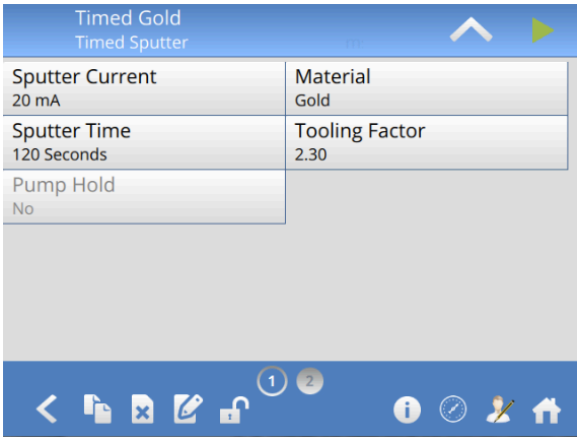
5. Running a Process

a. Press the **Recipes** button.
b. Press the ▼ button to view specific process parameters. To edit a recipe, see Sections 6.e-f.
c. If the "play" icon (▶) is gray, then the correct insert for that process is is not currently fitted. See the SOP for changing the process head insert.
d. If you do not see a recipe to fit your needs, a new one must be created; see Section 6 to create one.
e. To start a process, press the ▶ button on the screen for your chosen recipe. The vacuum pump will start to pump down the chamber.
f. Once a process has begun, the screen will show the progress and parameters for the chosen recipe. See the example at right. To cancel, press ✕.
g. Once the process is complete, the chamber will begin to vent. A message will pop up on the screen detailing the results. Press **OK** to accept. The **Recipes** screen will be shown again.
h. Open the sputter head to remove your sample.
i. Press the **Recipes** button, find **Vacuum Shutdown**, and then press the ▶ button on the right to leave the chamber under vacuum.



Recipes

Process in Progress



Process Properties

6. Creating and Editing a Recipe

a. On the home screen, press the **Recipes** button.
b. To create a recipe, press the ⊞ button at the bottom-left of the screen.
c. The **Choose Process Type** screen will be displayed. Select the type of process.
d. Enter a name for your recipe. Be descriptive; do not personalize the name. For example, "10 nm Au/Pd, no rotation" is much more helpful to other users than "Ryan's Au/Pd recipe". Press ◀ if you need to go back or cancel. Press **Enter** when you are done. The recipe will be created with default parameters.
e. From the **Recipes** menu, find your recipe and press the ▼ button to display its properties. See the example at right. Properties will be displayed across multiple screens. Tap the ① ② buttons at the bottom to scroll between screens. Additionally, you may tap ⧉ to copy a recipe, ✎ to rename a recipe, or ✕ to delete a recipe.
f. Tap the process property that you wish to edit. (Grayed out fields cannot be edited by users.) The screen at right will appear. Enter a new value for the parameter, then press **Confirm** or **Cancel** to finish.