

STS PECVD SOP

Description and materials notes:

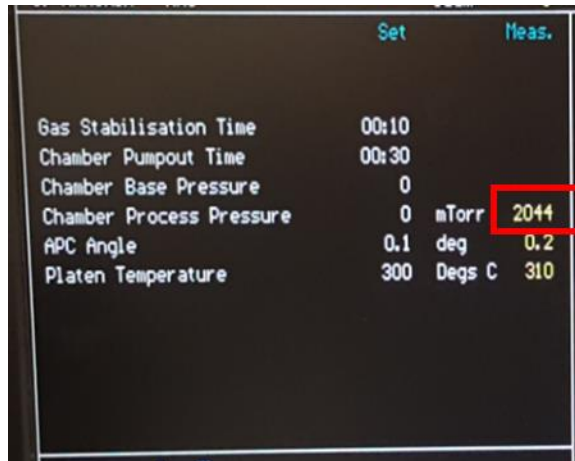
The PECVD STS tool is used to deposit silicon nitride, silicon dioxide and amorphous Si films. The system is equipped with 13.56 MHz and 187.5 kHz frequencies and is capable of mixed frequency recipes. The temperature of the system is normally kept at 300 °C. **Therefore, only the materials that are stable at these temperatures are allowed in the system.** No photoresist, polymers, etc... Use only clean METAL tweezers. You can process up to 4 of 4" wafers per run. Only Staff Approved materials may be introduced to this system.

Safety

- **Heat** – The chamber is 300° C and should never be touched.
- **Gases** – This PECVD system uses Silane, 5% Anhydrous Ammonia/N₂, Nitrous Oxide, Carbon Tetrafluoride (Halocarbon 14) 80%/O₂.
- **High Voltage** - High Voltage Radio Frequency is used throughout the system. System maintenance may only be performed by STS or NRF Staff. Do not remove any tool covers or defeat any interlock on this system.
- **Moving Components** - The User must exert caution when opening and closing the chamber lid. Your fingers after being violently detached by the chamber lid will prevent the system from reaching base pressure.

1.0 Loading the sample & starting process

- 1.1 Use the arrow keys on the keyboard to Choose "vent" (F3) from the menu
- 1.2 Choose "open valve" (F1)
 - 1.2.1. Watch the "Chamber Process Pressure" and make sure it goes to 2044. This will take a few seconds. If it reaches 2044 then proceed to step 1.3
 - 1.2.2. If the pressure did not reach 2044 then you need to retry. Simply choose "close lid" (F1). The blue screen will appear and then select any standard process.
 - 1.2.3. Wait for the purge to finish and you will see the option to vent again. Press the "vent" (F3) button again and it should vent properly this time.



	Set	Meas.
Gas Stabilisation Time	00:10	
Chamber Pumpout Time	00:30	
Chamber Base Pressure	0	
Chamber Process Pressure	0 mTorr	2044
APC Angle	0.1 deg	0.2
Platen Temperature	300 Degs C	310

- 1.3 The chamber is vented when the 2 push button lid lights on the front of the system are illuminated.
- 1.4 Depress the 2 blue push buttons in unison and hold in until the chamber lid is completely up.
- 1.5 If the chamber is flaking, notify NRF Staff.
- 1.6 Use stainless steel tweezers to place sample(s). If you have multiple small samples it's best to place them on top of a clean dummy wafer. WARNING: TAKE GREAT CARE NOT TO TOUCH ANYWHERE INSIDE THE CHAMBER. Gloves and fingers will melt.
- 1.7 When ready to close the lid. Depress "close valve" (F1) on the keyboard and depress the 2 blue push buttons in unison and hold until the lid is horizontal (as shown below).
- 1.8 Push on the right hand side of the lid gently



1.9 Again, push the 2 blue buttons until the lid is completely down and the blue screen appears.

1.10 You are then prompted to select a recipe. Use the following rules for recipe selection.

The recipe naming convention is as follows:

1st character: L=low freq, H=high freq, M=multi freq

2nd character: O=SiO₂, N=SiN

Remaining characters=thickness in Angstroms

EXAMPLE: 7500A of low frequency SiO₂ would be

LO7500A

1.11 If you need a thickness not provided, you may run more than one recipe on the same sample or contact NRF Staff.

1.12 Arrow to your recipe and depress enter.

1.13 The chamber will automatically pump down. It starts with a slow pump down and will give an error "pump down time exceeded". Ignore the error.

1.14 When pump down is complete, F1-F4 prompts will appear. Depress F1 "Deposit" to start your process.

1.15 To change the recipe without unloading the sample, depress F2 New Process.

2.0 Unloading the sample

2.1 When the process is completed, the program will go through an automated chamber and gas line purge. Be patient, it takes approximately 5 minutes.

2.2 Then choose (F3) "vent".

2.3 When the system is at atmosphere, the 2 blue lights on the front will illuminate. You may then press "Open Lid" and open the lid by depressing the 2 blue light switches until the lid is completely open.

2.4 Unload your wafer using metal tweezers. Caution the chamber surfaces are at 300 ° C.

- 2.5 Choose "Close Lid" (F1) and depress the 2 blue light switches until the lid is completely closed.
- 2.6 This will start to pump down the chamber. Reselect your recipe. Then the system will be returned to standby mode
- 2.7 Verify that you have recorded each recipe that you have executed. This information is critical for NRF Staff to keep the system properly cleaned and seasoned.

3.0 Modifying a program:

- 3.1 Staff will perform all recipe modifications.

4.0 Cleaning the Chamber:

All chamber cleans will be performed by NRF Staff.