



# CHEMICAL MECHANICAL POLISHING – G&P POLI-400L



These instructions are intended for reference only, and will *not* replace the thorough training required for proper system operation. Contact a clean room staff member with questions or to report a system problem.

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<p><b>1. BADGER:</b> Enable the tool in badger</p>	
<p><b>2. VERIFY SYSTEM STATUS:</b> The tool should be in an idle mode, which periodically sprays water to the platen. If the idle mode is not on and the polishing pad is completely dry, please inform superuser and staff. The pad then should be replaced.</p> <p>Turn off the idle mode by clicking 'IDLE STOP'. Press 'PREVIOUS' to go back to the main menu page.</p>	
<p><b>3. MOUNT YOUR SAMPLE:</b> You can find the carrier head inside the cabinet in a bucket. The head must be stored in water. If the carrier template is dried out, replace it with a new one.</p>	

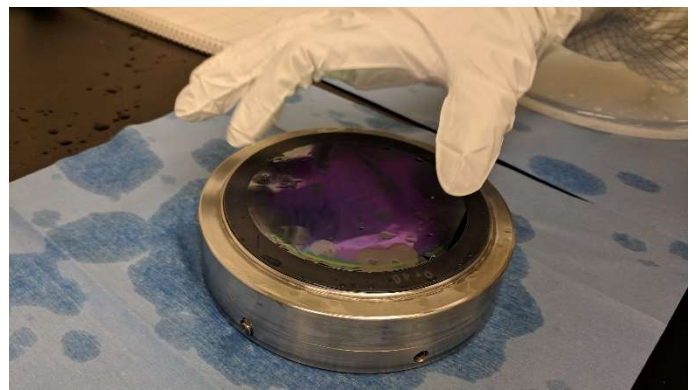
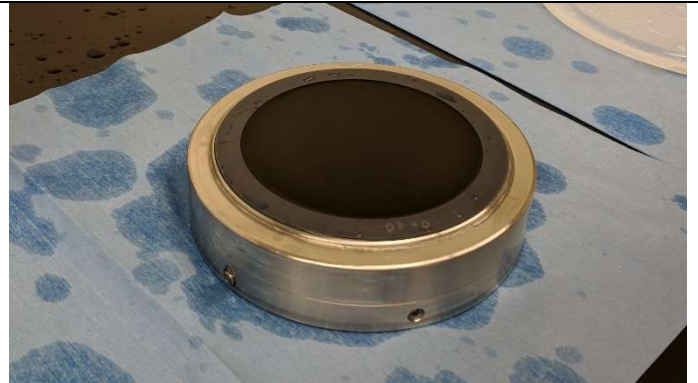




Check the thickness of the template. The ring thickness should be thinner than your wafer thickness.

Place the wafer on the template and gently press and rotate. Make sure the wafer sticks firmly.

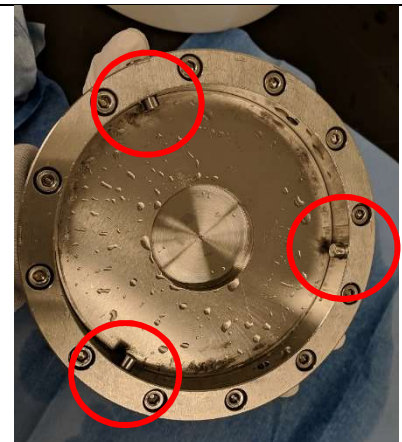
*You must wear chemical gloves when you are handling slurries and when working inside the equipment. Chemical gloves are available in the drawers.*



#### 4. MOUNT CARRIER HEAD:

Note that you need to push the door interlock button when opening the front door. Otherwise, you will get an error message. Once you are ready to start the process, close the door and push the door interlock button again.

There are three pins on the carrier head. Align them with the head 1 and turn left to lock.





<p>The carrier head is very heavy. Use both hands to hold the carrier head. Be careful not to drop it on the platen.</p>	
<p><b>5. CARRIER SELECTION:</b> On the main menu, go to 'CARRIER SELECTION' to check the correct carriers are selected:</p> <p>HEAD1: 4" wafer carrier           or 6" wafer carrier HEAD2: conditioner carrier</p> <p>Press 'PREVIOUS' to go back to the main menu page.</p> <p><i>You can turn on the light by clicking "LIGHT OFF" if needed.</i></p>	
<p><b>6. CLEAN POLISHING PAD:</b> Before the process, clean the polishing pad with DI water and the conditioning head.</p> <p>Go to 'MANUAL MODE OPERATION'.</p>	





Choose the platen speed as 50 rpm and the head2 speed as a half of the platen speed.

Set the running time 10 min. If the polishing pad is new, run for 20 min.

Press on 'PLATEN RPM', 'HEAD2 RPM', 'DIW', and 'HEAD 2 DOWN' to activate. Then, click 'START'.

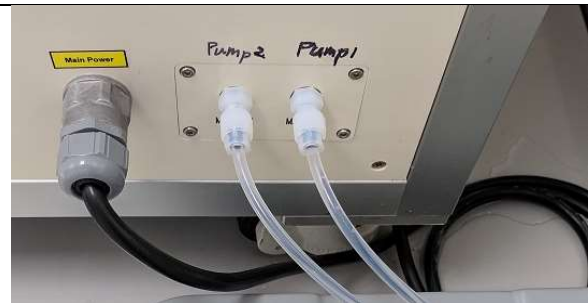


## 7. FEED SLURRY:

Three slurries are available:

- SS12 for general polishing
- Versum STI-2100 for selective  $\text{SiO}_2$  etching over  $\text{Si}_3\text{N}_4$
- KLEBOSOL 1501-50 for obtaining optically smooth surface of  $\text{Si}_3\text{N}_4$  (this requires the polishing pad change)

Pumping lines should be sitting in the DI water bottle inside the blue cabinet. All three types of slurries should be shaken well before use. Once the solution looks homogeneous, place the



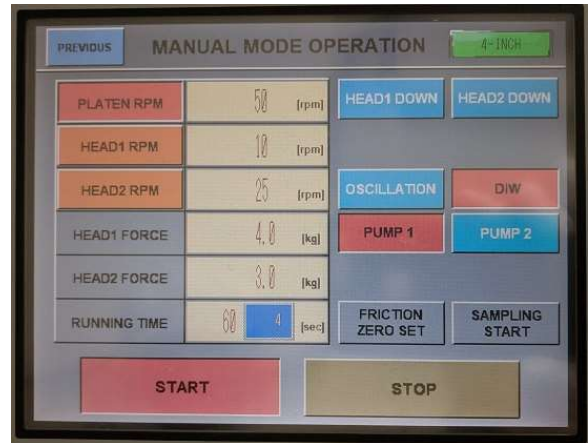


correct tubing into the slurry (marked above the pipe connection).

PUMP1: SS12 and KLEBOSOL  
PUMP2: Versum STI2100

On the manual mode operation, activate 'PUMP1' (or 'PUMP2'), 'DIW', and 'PLATEN RPM'. Click 'START' to check the slurry is pumping well and to fill the pumping line. Set the running time 5 min. You can stop at any time by pressing 'STOP'.

Press 'PREVIOUS' to go back to the main menu page.



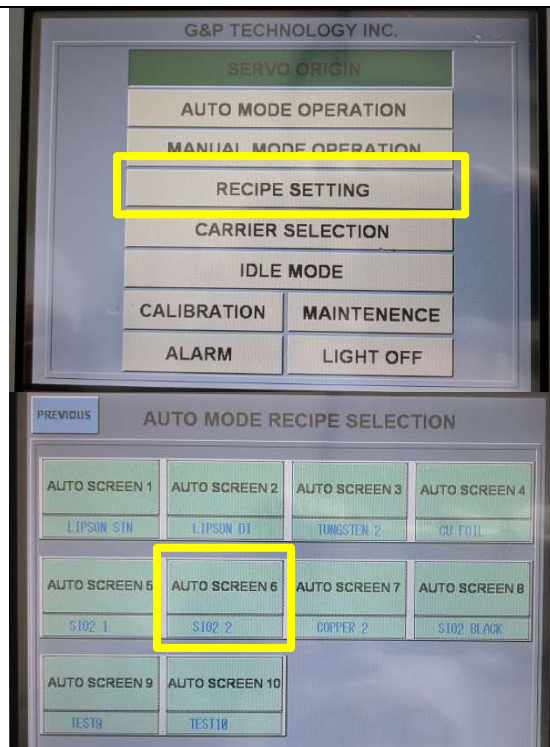
## 8. DEFINE YOUR PROCESS:

Go to 'RECIPE SETTING'.

Choose the recipe. Currently SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub> recipes are available to use.

The recipe has four steps: wetting, soft land, main polish, and buffing.

You can click 'NEXT' to see all other parameters.





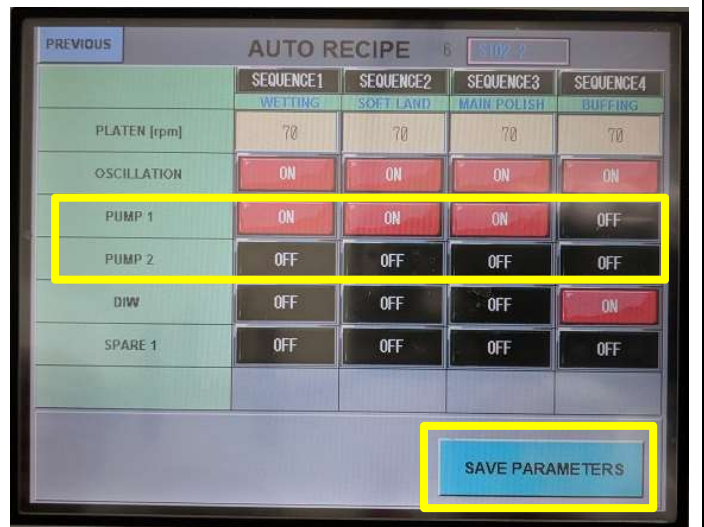
Keep Head1 and Head2 speed at 35 rpm and Platen speed at 70 rpm.

If you're developing the recipe, Head1 Force (kg) and running time for Sequence3 can be optimized. A higher force can result in a faster rate. However, too much force will lead to non-uniform polishing.

**Make sure the recipe refers to the correct pumping line.**

If you are smoothing the surface with KLEBOSOL and the black polishing pad, do not use the diamond conditioning head. Turn off head2 in the recipe.

Press 'SAVE PARAMETERS' and go back to the main menu page.



## 9. SWITCH DRAIN:

Before running the recipe, close the main DIW drain and open the valve to the chemical waste. Check the waste bottle has enough room. Do not overfill the bottle.





If the buffing step is long (>30 sec), it's recommended to switch it to DIW drain at Sequence #4.



## 10. RUN RECIPE AND CHARACTERIZATION:

Go to 'AUTO MODE OPERATION' and choose the recipe.

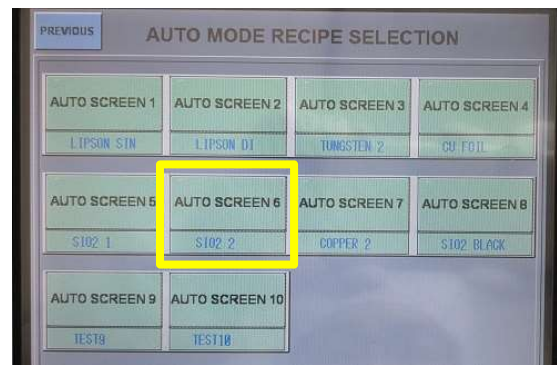
Press 'START'.

Once the process is done, push the door interlock and detach the carrier head.

Clean the carrier head and the conditioning head with DI water spray gun.

Take out the carrier and unload your wafer to measure the thickness. Don't forget to store the carrier head back inside the water bucket.

Repeat **steps 3, 4, 9, and 10** until you achieve the target thickness.







## 11. RETURN TO NORMAL:

Close the valve to the waste bottle and open the valve to the main drain.

Rinse the conditioning head thoroughly with DI water spray gun.

**Place the pump line back to the DI water bottle and close the lid of the slurry.**

Go to 'MANUAL MODE OPERATION' and clean the pump line and the polishing pad with DI water (see **step 6**) for 10 min.



## 12. IDLE MODE:


Light off if you turned it on.

Go to 'IDLE MODE' and press 'IDLE START'.

Make sure the water line is in a good position to wet the entire polishing pad.





	<p>Don't forget to turn off the door interlock.</p>	
<p><b>13.</b></p>	<p><b>BADGER LOGOUT:</b> Don't forget to disable the tool in badger after you're done.</p>	