Laurell spinner #1 (right side of desk) is reserved for spinning photoresist material ONLY.

This manual assumes that the machine is always in its proper resting state, with the standard vacuum chuck in place, and basic operation is completed by putting the machine back in that condition. Even so, check to see that the waste chemical collection jar at the rear of the machine is empty before you begin. Turn on the hot plate and let it warm up to the desired temperature before starting. The standard process temperature is 90C. Acetone is used to clean this machine but care must be taken to not get any into the mechanical parts of the spinner. Never spray directly into the basin. Only use wipers.

0. Turn on the vacuum and compressed air utilities to this machine.

1. Turn on power using toggle button at the rear right of the machine, wait for boot sequence to complete. A three line menu will appear:
2. Press the down arrow twice \( \downarrow \downarrow \) to select line 3, ‘static’

3. Press edit mode \( \text{Edit mode} \) (Step 3 should not normally need to be done. If you will use the Static program as-is, skip to Step 3g and check the parameters of all three pages and if correct, skip to Step 4. If not correct, perform steps 3b thru 3h.)

   a. Hit down arrow once \( \downarrow \) and you will come to page 1 of the static routine.

   b. This shows the operational parameters for step 001 of 005 steps.

   c. To modify any parameters on this page, use the up and down arrows \( \uparrow \downarrow \) to highlight the desired line.

   d. Then use page up \( \uparrow \) and page down \( \downarrow \) buttons to step forward or backward through the individual parameter fields.

   e. Once a field is highlighted, use the up and down arrows \( \uparrow \downarrow \) to change the value of the parameter.

   f. Repeat steps d. and e. until all parameter fields on the page are correct.

   g. To change to the parameter page of the next step of the program, use the reverse and forward buttons \( \leftrightarrow \) to change the step number. Then perform steps c., d. and e. until all parameters are set.

   h. Repeat steps g., then c., d., and e., until all pages of the program have been modified to suit needs.
i. Standard operating process is: three steps, spreading, spinning, and spin down. Spreading is done for 2 secs at 500 rpm. Spinning is done at 1500 rpm for 30 secs. Spin down is done for 2 secs to 50 rpm. **If you find it necessary to change these parameters, you must change them back to the standard settings when you are done.**

(Steps 002 thru 005 parameter pages for static spin program, shown above)

4. If you will dispense by hand, skips steps 4-7.

For autodispense, you must load the autodispense syringe, then fill with photoresist reagent. Pour the photoresist into the syringe barrel until the fluid is level with the top marked black line. Install the syringe cap, while supporting the bottom of the autodispense block so it won’t break. Wipe off the reagent bottle neck and replace cap.

5. Open the lid and insert a green needle with a Teflon tip into the twist lock cap, by twisting the cap, **not the needle**, into place.

6. Place a scrap plate the same size as your intended plates on the vacuum chuck. (2”, 3” or 4” square)

7. Engage vacuum at the control panel and close the lid.

8. If you are doing hand dispense, dispense your material before closing the lid. Then, proceed to step 13.

9. You are ready to run a spin program to purge the dispense path of air and to adjust the dispense volume. Press the run mode button.

10. The spinner should be preset to dispense the correct amount of fluid, roughly to a spot size the size of the black o-ring on the vacuum chuck. If this happens, proceed to spinning your plates. If not, adjust the pressure on the left side of the spinner to dispense the correct amount by running a few more cycles with the scrap plate. There is no need to take it out, but you will have to raise and lower the lid to reset the cycle completion lockout. Once the volume dispense is set correctly, proceed to run real plates.

11. Open the lid. If the standard spin chuck is of appropriate size for your plate (2”, 3” or 4” square), proceed by placing a real plate on the chuck, centered. **(if you need to use an alternate chuck, see NOTE1 at the bottom of this document)**

12. Engage the vacuum as before, check the substrate to see that vacuum is applied.
Material must not be allowed to flow off the side of a substrate before spinning or during the initial ramp up or it could be pulled around under the substrate and get pulled into the vacuum system. This is very bad for the O-ring vacuum seal holding the plates on the chucks, and for the electronics and motor underneath the chuck. (The diagram underneath, illustrates how to gauge appropriate coverage of a plate. If you imagine the plate in nine equal sectors you should aim to dispense a circle that would encase the middle square, and extend out to leave a half inch margin from the edge. Any fluid dispense level between those circles is appropriate.)

13. Close the lid and hit the Start button.

Be careful to not step on the vacuum service pedal during a spin operation.

14. The countdown of each step will be indicated on the display. When the program completes its finals step, the bottom line of the parameter page will say “Done”.
15. Open the lid. (The ‘Done’ message will not reset and the machine will not run again if you do not)
   a. Press the vacuum button again to disengage the vacuum.
   b. Remove substrate and place on hot plate.
   c. Start hot plate timer. (Standard hotplate flash time is 90 secs or more)
   d. Place a new substrate on the spin chuck and repeat steps 5a thru 6c until all substrates are coated and flash baked. Watch the timer and remove your substrate at the appropriate time (90 secs). If the spin cycle of the next plate finishes while the previous substrate is still on the hot plate, the wet coating on the just spun plate will be forced to wait, and this could allow some difficult wetting chemicals to begin to de-wet the surface in the form usually of little pinholes.
   e. Do not dispense material until the syringe is empty or you will need to purge the oline again with a scrap plate in place. Refill the syringe as needed. Do not fill past the top marked line or photoresist will get on the cap seal. If this happens, wipe it off during cleanup.

16. When the last substrate is done being spun, it is time to clean up.
   a. Leave the utilities ON even though you may be tempted to turn them off first.
      This will maintain some positive pressure on seals to prevent chemical fumes from being sucked into the motor.
   b. Open the syringe at the top and fill to the top line with acetone.
   c. Replace the cap and run the program a few times until the syringe is clean, and empty.
   d. Remove the cap and wipe with acetone.
e. Use a series of wipers to wipe down the inside surfaces of the spin coater and discard.

f. Wipe excess spin material into the rear waste collection drain hole.

g. Use Acetone on wipers to wipe down the surfaces again.

**DO NOT SPRAY ACETONE INTO BOWL DIRECTLY FROM THE SPRAY BOTTLES!**

h. Wipe down the inner surfaces several times until you are sure that there is no residual chemical left in the machine and there is no more red color showing up on the wipes. Remember to push a wiper into the drain hole to clean the drain.

f. Close the lid.

g. While supporting the chemical waste collection jar from underneath, unscrew it from the machine and take it over to the waste chemical collection jugs in the hood. Dump excess chemical into the waste collection container that is for waste polyimide chemical, fill out the log sheet to record the amount and type of waste added.

h. Wipe out the container with Acetone/wipes until clean, and then reinstall on the machine. Make sure to check the seals around the waste collection system for leaks and clean anything up that you see is needed.

i. Turn off power to the machine, turn off the vacuum and nitrogen utilities.

j. Turn off the hot plate once your last substrate comes off, and when it is cooled, wipe down the top surface with an Acetone/wiper. **Do not do this when it is still hot.**

The main cautionary pages from the manufacturer’s manual:
• Care should be taken not to flood the process chamber during cleaning.

• If unit is equipped with a vacuum chuck, it is important not to allow chemicals or chemical cleaners to enter the vacuum path.

• NEVER flood or spray solvent such as acetone or any other type of cleaner directly onto the keypad surface. Doing so may cause keypad failure. Always wet a wipe or cloth with the solvent and gently wipe the keypad surface.

NOTE!
The vacuum path is not designed for any pressure. Air pressure or any liquid forced or drawn into the vacuum chuck will very likely damage the vacuum sensor, seals, motor and electronics. This type of damage is not covered by our warranty.

• CLEANING - Clean, rinse, then dry your spin processor after each use, taking care to prevent any chemicals from entering the vacuum path. A good practice is to cover the chuck during bowl cleaning. This can be done with a wafer with vacuum turned on or use a cover such as Petri dish. ALSO DO NOT FLOOD

THE AREA BETWEEN THE STATIONARY SEAL AND THE ROTATING SEAL. THIS CAN CAUSE MOTOR OR ELECTRONICS DAMAGE. See Fig. 4-1 below. Do not fill up or overflow the process chamber or bowl – fluids must not be permitted to flow under the substrate. If the chuck face shows signs of chemical residue, remove and clean immediately. Cleaning the o-ring surface will improve the seal. Examine and adjust your process to prevent such occurrences. See section 4.1.3 Vacuum Chuck Wet Test.

![Diagram of vacuum chuck](image)

Figure 4-1

Do not at any time force fluids or pressuring gas in the center of the vacuum chuck. Cleaning the vacuum path in this manner is dangerous and can cause significant damage to your spin processor.

NOTE1: If you would like to use one of the other chucks for this spinner, they are designed to fit ON TOP of the standard chuck. The standard chuck should not be removed. Just place the chuck you would like to use on top of the standard chuck, and use accordingly. Substrates must extend past the o-ring of any
chuck used in spinning to prevent fluids from being sucked around the backside of a substrate and onto and past the o-ring seals. It is better to use a smaller chuck than one that is exactly the same size as your substrate.

If a special chuck is used, remove it at the beginning of the cleanup process, wipe it down well with an IPA/wipe and place back in the chuck storage box.

For any questions or technical problems, please see this machine’s primary manager,

**Bentley Wall, 330-221-7048**