

Solitec Spin Coater Operating Instructions

This machine is to be used by authorized personnel only. For training & consultation contact:
Lab Manager, **Omid Mahdavi**, (520) 621-9849, omidm@email.arizona.edu

You MUST enter all necessary information in the Log Book for each use.

1. Make sure you have “Enabled” the tool on Coral. The Coral interface indicator located on the spin coater deck should be ON ([see Fig. 1](#))

Setup

2. Locate the spin coater’s power toggle switch on the bottom right hand corner of the control panel and make sure it is “up”.
3. Make sure that the RESIST cycle and COAT buttons on the control panel are depressed and lit ([see Fig. 2](#))
4. Maintain a clean environment around the spin coater to minimize particle generation during spin coating. Use Acetone or IPA and cleanroom wipes to clean the area on the spin coater deck. Make sure you change the Aluminum foil lining of the spin coater bowl after you are done with your spin coating tasks. The spin coater bowl MUST always be covered with heavy duty Aluminum foil located in the exhaust hood next to the Solitec station.
5. Select a spinner chuck according to the size of the substrate you will be coating ([see Fig.3](#))
6. Make sure the spinner chuck is clean and free of any residual resist or polymer. Clean with Acetone and cleanroom wipes if necessary.
7. Gently press down the spinner chuck onto the spindle ([see Fig. 4](#)).
8. Using a substrate tweezer, if practical, place your substrate on the spinner chuck and center it ([see Fig. 5](#)). Make sure your substrate covers the spinner chuck completely otherwise the film you are planning on coating will cover the chuck and contaminate the backside of your substrate. It may even result in the loss of vacuum and ejection of your sample during the spinning process.

Centering

9. Press the vacuum button on the deck to hold down your substrate ([see Fig. 6](#)).
10. Locate the SPINDLE SPEED knob directly underneath the RESIST cycle button on the control panel. Make sure it is turned all the way counter clockwise.
11. Locate the TIME knob directly underneath the RESIST cycle and SPINLE SPEED knobs. Set the knob to 30 seconds.
12. Press the START button on the deck and slowly increase the SPINDLE SPEED ([Fig. 8](#)) under the RESIST cycle by turning it clockwise. The red light for the RESIST cycle should be lit ([see Fig. 7](#)). Watch your wafer/substrate to ensure that it is properly centered and situated on the spinner chuck. If it is not centered, release the vacuum by depressing the VACUUM button on the deck and center your substrate. Repeat until your substrate is centered adequately. Centering becomes more critical at higher spin rates.
13. For a 2 step spin process, depress the SPREAD button and make sure it’s lit. Verify its operation in the same manner as the RESIST cycle using the SPINDLE SPEED and TIME

knobs located directly below the SPREAD button. Once the RESIST cycle is completed the SPREAD cycle will initiate.

Typical Resist Spinning Process with HMDS and AZ3312

14. The typical lithography process in the cleanroom may use the AZ3312 positive resist and HMDS primer supplied by the lab.
15. Check the digital temperature and humidity monitor mounted on the wall behind the spinner. If the humidity levels are above 50% we recommend that the HMDS primer be dispensed and spun on your substrate for optimal resist adhesion to your substrate.
16. Both the HMDS and AZ3312 are dispensed using the clear 4mL disposable plastic transfer pipetts stored on the spinner deck along with other accessories.
17. Typical rule for dispensing HDMS is to use less than 0.5mL per every 1 inch in substrate diameter. The HMDS is dispensed while the substrate is being spun at a speed of less than 1000 rpm (1 KPRM) in the RESIST cycle and is allowed to spinoff and evaporate completely by spinning for at least 60 seconds.
18. To dispense, hold the pipette over the center of the wafer and press the START button while quickly squeezing out the contents of the pipette onto the substrate. The HMDS will spread and evaporate quickly (see Fig. 9).
19. Typical rule for dispensing photoresist is to use at least 1mL of photoresist for every 1 inch in substrate diameter. The resist is dispensed in a static fashion and allowed to puddle before spinning the substrate. To dispense, hold the pipette over the center of the wafer. Carefully squeeze the photoresist out of the pipette onto the substrate and allow it to puddle but not go over the substrate's edge. Avoid bubbles. Press the START button and wait for the spin cycle to end. At 30 seconds and at 4000rpm (4 KPRM), a 1.2um thick AZ3312 film is spun on the substrate.
20. Release vacuum by depressing the VACUUM switch on the deck after the wafer has finished spinning and remove it for a soft bake. The typical AZ3312 soft bake time is 60-90seconds at 90C. The soft bake can be performed either in the oven or on the hotplate located on the table next to the spin coater station.

Table 1- Summary of a typical Solitec coater setup

HMDS	Cycle	RESIST
	Spindle Speed	1 KPRM
	Time (seconds)	60
AZ 3312	Cycle	RESIST
	Spindle Speed	4 KPRM
	Time (seconds)	30



Figure 1 – Coral indicator



Figure 2 - control panel

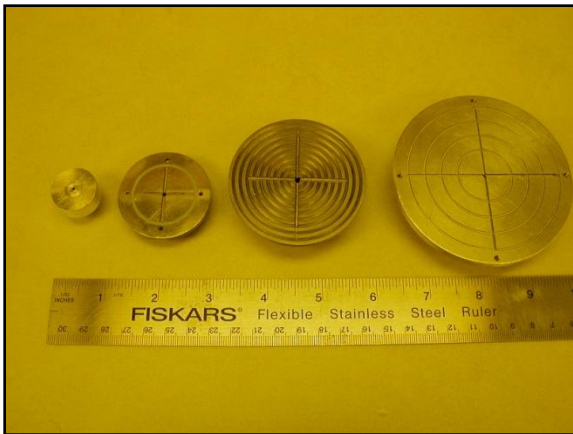


Figure 3 – available spin chucks

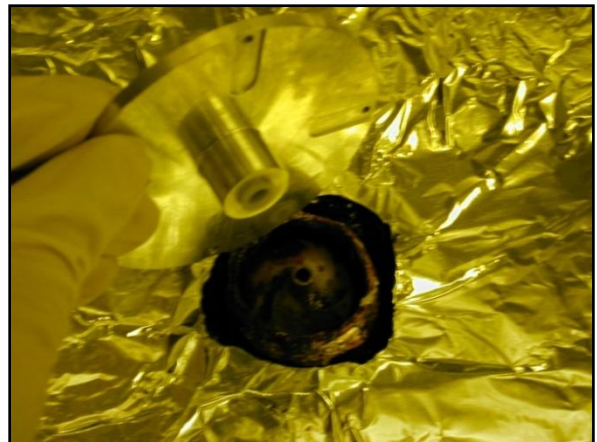


Figure 4 – placement of chuck on the spindle

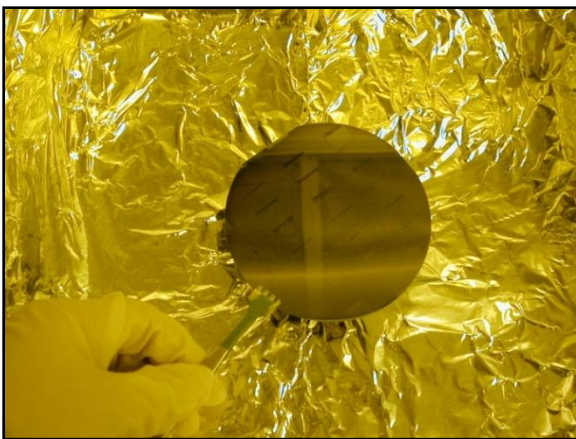


Figure 5 – placement and removal of substrate



Figure 6 – spin coater controls on the deck



Figure 7 - adjusting the spin rate



Figure 8 – spin rate at 2000 rpm (2 KPRM)

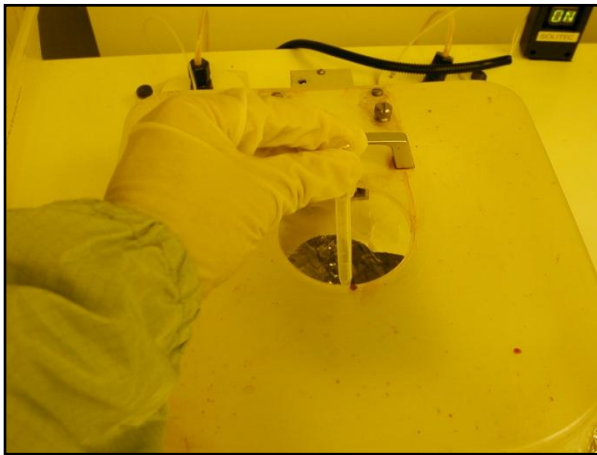


Figure 9 – Dispensing through the opening on the lid