

Suss Delta 20 Spinner and Hotplate SOP

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1.0 Safety

Moving Components – The User should be aware at all times of the moving components associated with this tool. Users are not allowed to adjust any mechanical devices within this machine. If an error or problem occurs, put the coater down in the NRF web site with comments and notify NRF Staff. Do not attempt to fix the problem.



Use caution when using the spinner. It's hard to tell when it's spinning. Press the "Stop" button shown below before removing your sample.



Use caution, do not touch the Hotplate.



2.0 Quality Control and Calibrations

Thickness measurements may be made using the Filmetrics F40 located in the Bio/Nano Bay. Regular interval checks of thickness will not be performed for this spinner. Staff is available for help and advice. Photoresist and PMMA thickness is determined by the casting spin speed. Be advised that thickness and uniformity will be affected by your sample size, surface tension and topography of the sample.

3.0 Equipment Uses and Restrictions

Each spinner in the NRF is dedicated to certain materials. The Suss Delta 20 may ONLY be used for approved materials listed below. These are the ONLY materials you may spin without Staff consent. This system has the ability to dispense materials by automated syringe if needed, consult with Staff for instruction.

Approved Materials List (all viscosities for these materials OK)

AZ-nlof 2035	PMMA	AZ-1512	AZ -1512	AZ-9260
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4.0 Equipment Specifications

- Sample sizes: 4", 3", 2" round or square, fragments from 10mm to 100mm
- Auto-syringe dispense = available for dispensing other materials (email Staff)
- Maximum RPM = 5000
- Hotplate Temperature to 200C

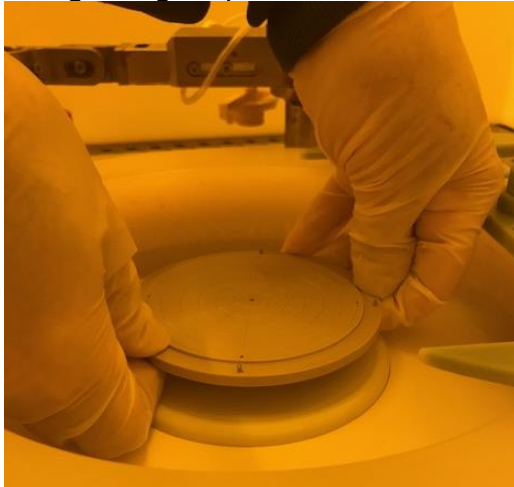
5.0 Spinner Operation



Use caution when using the spinner. Be certain the spinner has stopped. The display will show "END" as shown below when it's stopped.



- 5.4** Chucks are removed by grasping both sides of the chuck as shown and pulling straight up.



- 5.5** To install a new chuck, align the spin motor shaft pin as shown below and push chuck all the way onto the shaft.



- 5.6** The existing spin recipes are not changeable by users and are shown below in Table 5.1. Recipes exist for Static and Dynamic dispense modes.

Step 1 is for dispensing or spreading the material. Step 2 spin speed determines the thickness. Use the manufacturing spin thickness curves (located at the end of this SOP) to decide what spin speed to use. Recipes exist for spin speeds of 1000-4500RPM in 500 RPM increments. The time for step 2 is 60 seconds for all recipes which should be long enough to fully dry and establish the correct thickness per the manufacturers spin thickness curve.

Table 5.1

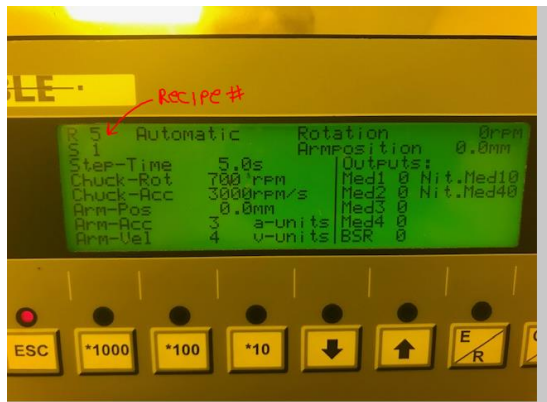
Recipe Number	Step 1 time/sec	Step 1 spin speed	Ramp Velocity RPM/sec	Step 2 time/sec	Step 2 spin speed	Ramp Velocity RPM/sec
Dynamic Dispense Recipes						
1	5	700	3000	60	1000	3000
2	5	700	3000	60	1500	3000
3	5	700	3000	60	2000	3000
4	5	700	3000	60	2500	3000
5	5	700	3000	60	3000	3000
6	5	700	3000	60	3500	3000
7	5	700	3000	60	4000	3000
8	5	700	3000	60	4500	3000
9						
Static Dispense Recipes						
10	3	1000	500	60	1000	3000
11	3	1000	500	60	1500	3000
12	3	1000	500	60	2000	3000
13	3	1000	500	60	2500	3000
14	3	1000	500	60	3000	3000
15	3	1000	500	60	3500	3000
16	3	1000	500	60	4000	3000
17	3	1000	500	60	4500	3000
18						
19						
20						

- 5.2 Decide if you want to do “dynamic” (recipes 1-8) dispense while the wafer is spinning) or “Static” (recipes 10-17) dispense just before you press recipe “start”).
- 5.3 To select a recipe. On the process controller, press ESC if needed to get to the main menu as shown below.
- 5.4 Arrow to “Automatic”, and press the E/R key. On the next screen press the

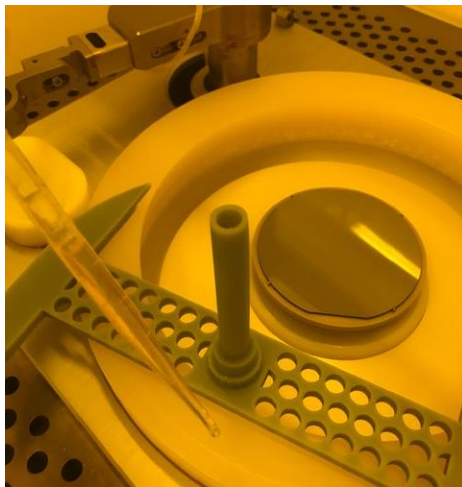
UP arrow and press the E/R key. The “Start Recipe No. should be highlighted as shown below. Use the arrow keys to change the recipe number and press E/R key.



- 5.5 The screen will display the recipe as shown below. Verify the recipe number is correct.

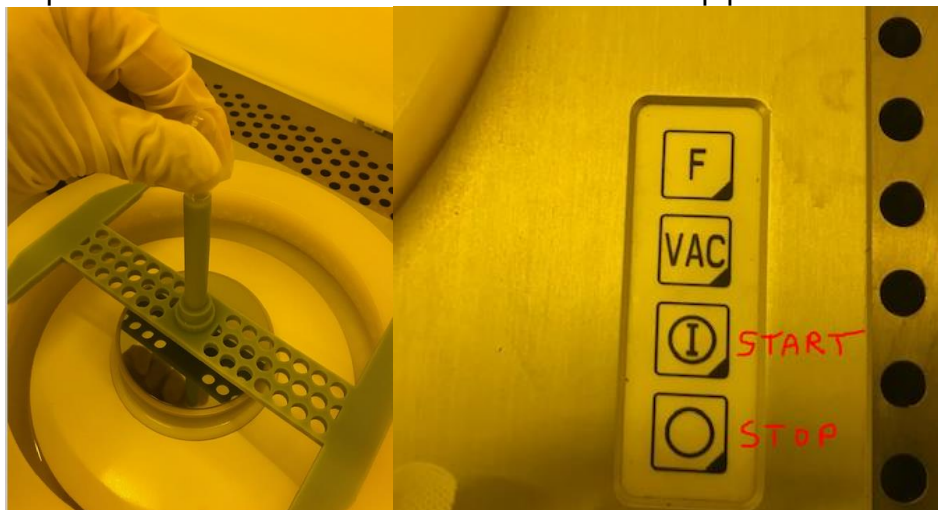


- 5.6 If you want to use the auto-centering pipette holder (shown below) during dispense, place the holder off to the side of the bowl as shown below.
- 5.7 Fill the pipette and insure it's bubble free and not dripping. To coat a 4" wafer with AZ NLoF 2035, AZ9260 or PMMA-A6, fill pipette with 3ml. For thinner materials such as AZ1512, PMMA A2/4 only 2ml is needed.

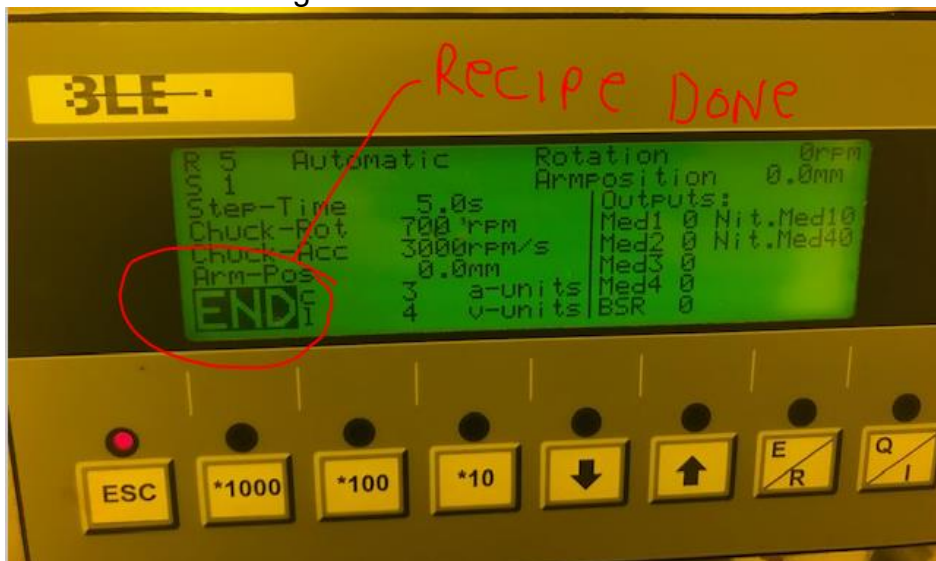


- 5.8 Insert pipette all the way down inside the holder tube. Place the holder centered over the sample.
- 5.9 If doing “static”, dispense enough puddle to cover 50% of the substrate and

then press “start”. For “dynamic” press start (see pic below) and within 5 seconds squeeze the dispense bulb fully and release bulb. You should dispense most but not all of the solution from the pipette.



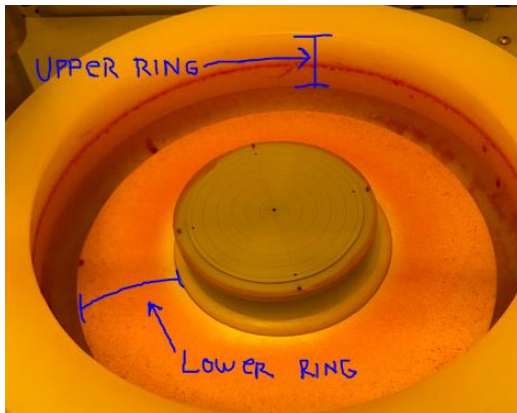
- 5.10 Wait until the “END” prompt (shown below) shows on the display before removing your sample. The system does not display the recipe elapsed time while it’s running.



- 5.11 CLEANING THE BOWL
- 5.12 If you are using the 4” wafer chuck, load the 4” dummy wafer onto the vacuum chuck. Run a process recipe and use the acetone squirt bottle to clean the outside area edge of the chuck while the wafer is spinning (as shown below). If using other chucks, just remove the chuck and clean by hand. Remove the chuck using two hands as described above.



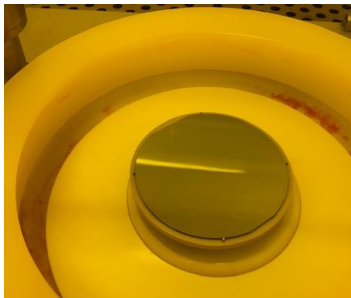
- 5.13 Clean the upper and lower bowl rings and areas shown below using acetone and wipes. The lowest bowl will have some material left, that's OK.



- 5.14 When not in use, store the acetone bottle as shown below with the spout over the drip trap or inside the chucks tray. Don't drip acetone through the perforated tool surface.



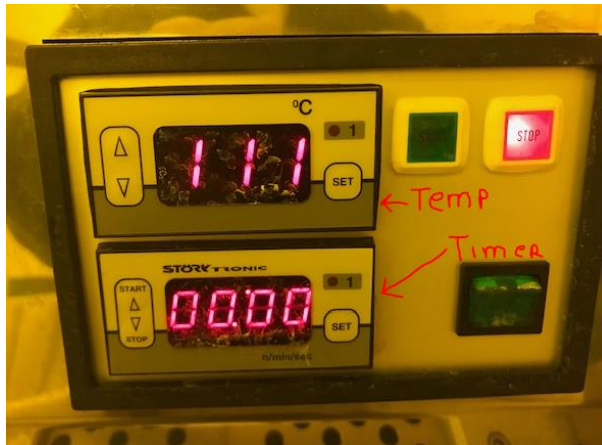
- 5.15 The bowl should be clean as shown below when done. It's OK to leave some resist in the bottom bowl ring.



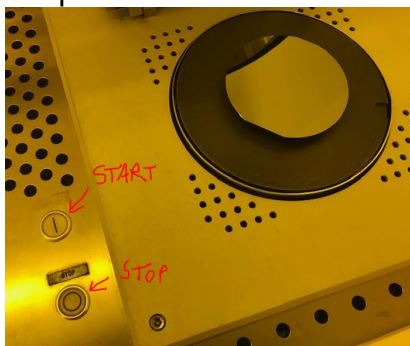
6.0 Hotplate Operation



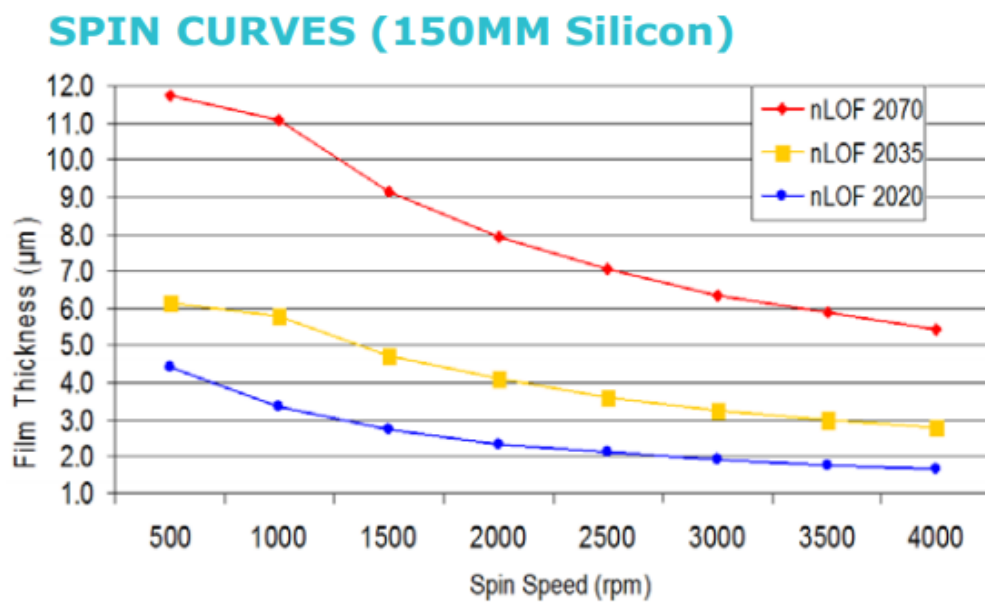
- 6.1 The hotplate is for use with 4” and larger wafers only.
- 6.2 The upper controller controls the hotplate temperature. Temperature is change by pressing and holding the “set” button and pressing the UP/Down buttons.



- 6.3 The process time is set using the lower controller by pressing and holding the “set” button and pressing the UP/Down buttons.
- 6.4 Verify the backside of the wafer is clean. i.e. no photoresist. If it requires cleaning use a lightly acetone moistened swab.
- 6.5 Place the wafer on top of the hotplate lift pins.
- 6.6 Press the start button and the lift pins will go down. The pins will raise at the end of the programmed time. You may stop it early by pressing the “stop” button.

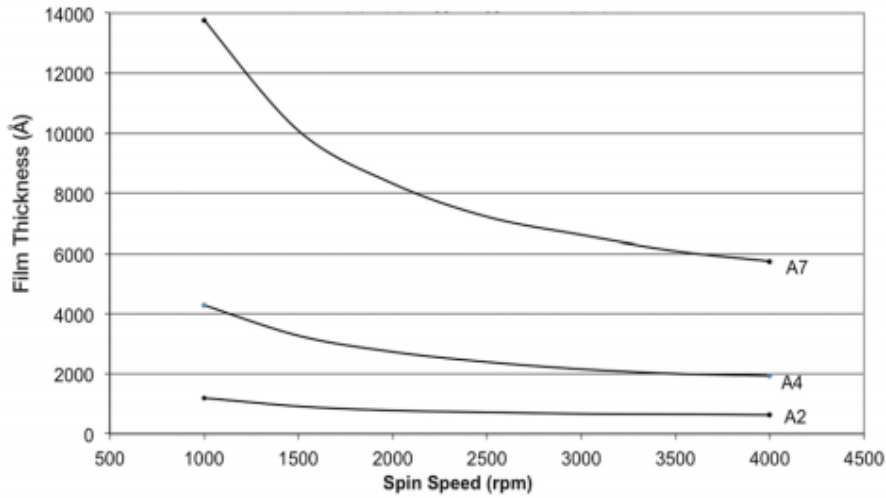


AZ NLOf 2000 Series Thickness vs. Spin Speed Curve

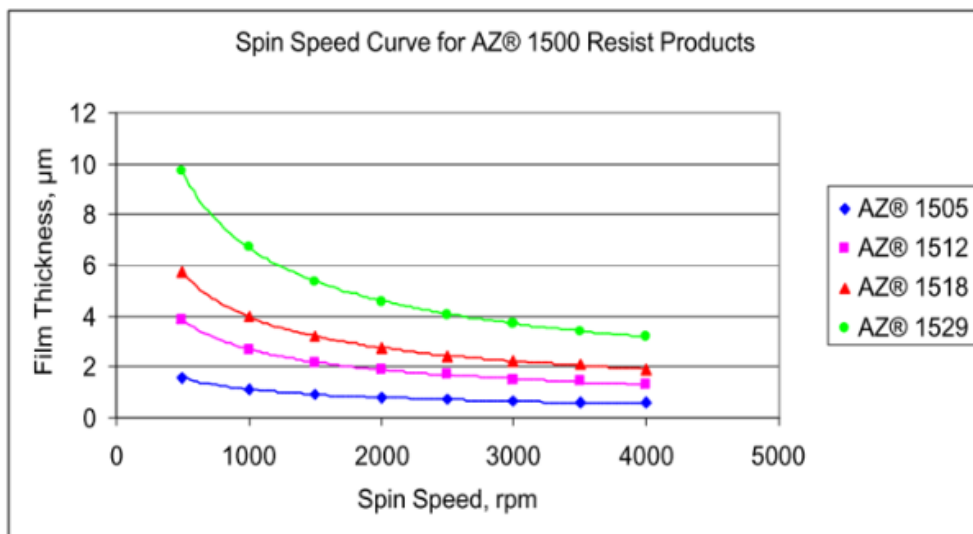


Microchem 950PMMA-Anisole thickness curve

950PMMA A Resists Solids: 2% - 7% in Anisole



AZ 1500 Series Thickness vs. Spin Speed Curve



AZ 9200 Series Thickness vs. Spin Speed Curve

AZ® 9200 Series Spin Curves

