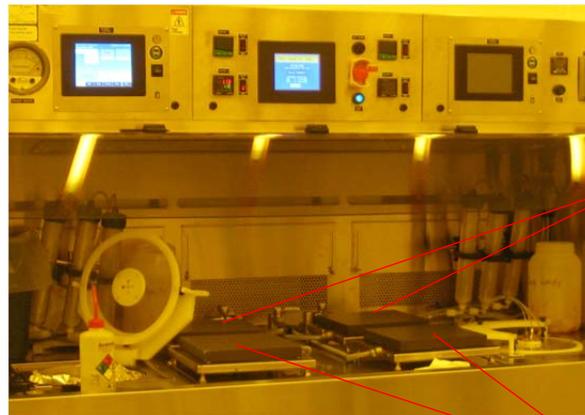


## Spinner and Hotplate Hood



Inner hotplates

Outer hotplates

### 1. Introduction

The Spinner and Hotplate hood is used to spin-coating photoresists and polymers on wafers as well as on small chips. There are 2 identical spinners and 4 hotplates in the hood. The spinner allows for the spin speed, ramp rate and time to be adjusted. 4 hotplates are controlled independently by four thermostats. The inner 2 hotplates allow user to program and store their processing programs. And the outer 2 hotplates are used for baking under constant temperature settings.

### 2. Features and Specifications

#### 2.1 Spin-coater

Maximum Spin Speed	6000	RPM/s
Maximum Ramp	30000	RPM/s
Speed Accuracy	<0.2 RPM	
Maximum Substrate that will fit in the bowl	200mm	
Recipe Storage	Virtually unlimited	Recipes

#### 2.2 Hotplates

- Temperature range: 49 °C to 325 °C
- Maximum temperature ramp up rate: 100 °C/min
- Temperature Accuracy: 1% of setpoint
- Top plate dimensions: 9" X 9"
- Programs can be stored for each programmable hotplate: 31

### 3. Safety and Precautions

- The spinner spins at very high speeds, DO NOT attempt to operate with the lid open!
- During the spinning procedure, ensure the fume hood sash is down, and the spinner is covered to avoid splashing of chemicals.
- Do not try to open dispense cartridges, they are pressurized.
- Do not smell or inhale photoresists or other coating materials, those might be toxic.
- Refer to MSDS of the material that is to be spun before spin-coating process.
- Hotplates can cause burns, do not touch the top surface when hotplate is ON.

### 4. PPE (Personal Protective Equipment) Required:

Safety glasses or goggles are required to use this equipment.

### 5. Operating Procedure for Spinner

Do NOT touch the dispense cartridges. Do NOT let photoresist get on your gloves. If it does, do not touch anything and change the gloves immediately. Clean the spinner bowl and lid every time after use.

#### 5.1 Edit and load a spin-coating recipe

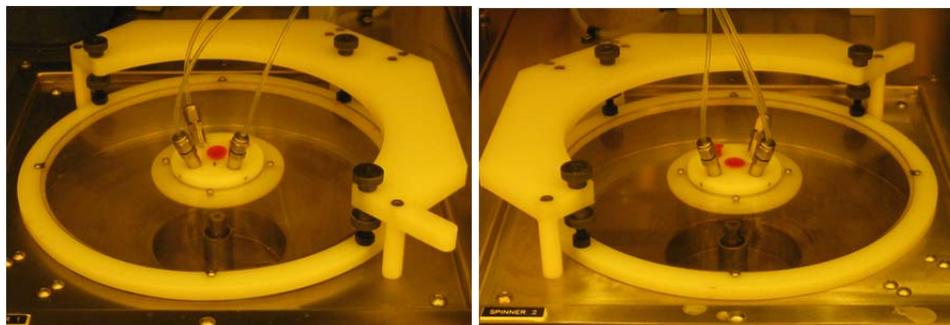


Figure 1

1. The two spinners (Figure 1) are separately controlled by Brewer Science software. The touch screens are on the forehead of the hood. If the screen looks dark, touch the screen once with the touch screen pen to show the screen.
2. Click on “Edit” from the bottom of the screen (Figure 2 left). Then click on “Spin Recipes”. The “Recipe Manager” screen will show up (Figure 2 right).

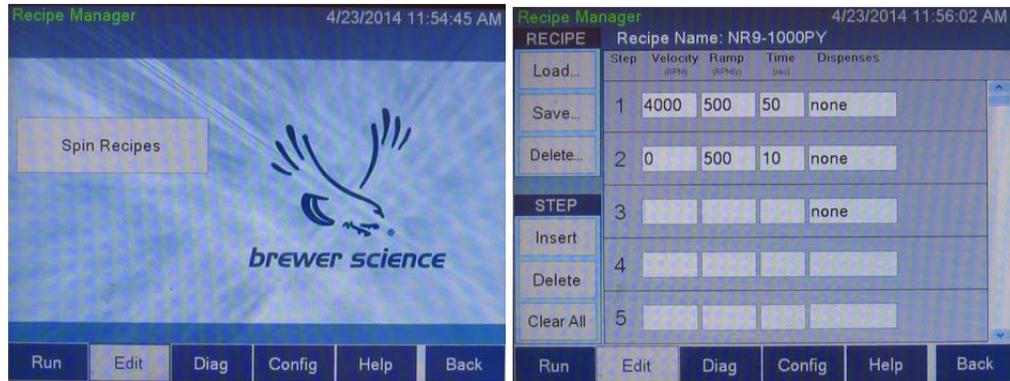


Figure 2

- Use the touch screen pen to input values of Velocity, Ramp, and Time to their fields for each step of your recipe. Neglect the “Dispenses” fields.

**RPM** – Revolutions per Minute

**RAMP** – unit is RPM/s, it determines how fast it can go to the set RPM

*e.g. with a RAMP value 500, it needs 2 seconds to accelerate from 1000 to 2000 RPM*

**TIME** – How long the step will be

- After input necessary values, click on the “Save” button to save the recipe. It will allow you to input a recipe name.
- Click on the “Run” button on the bottom of the screen (Figure 3 left). Then click on the “Run Spin Process”. The “Spin Process” screen will show up (Figure 3 right).

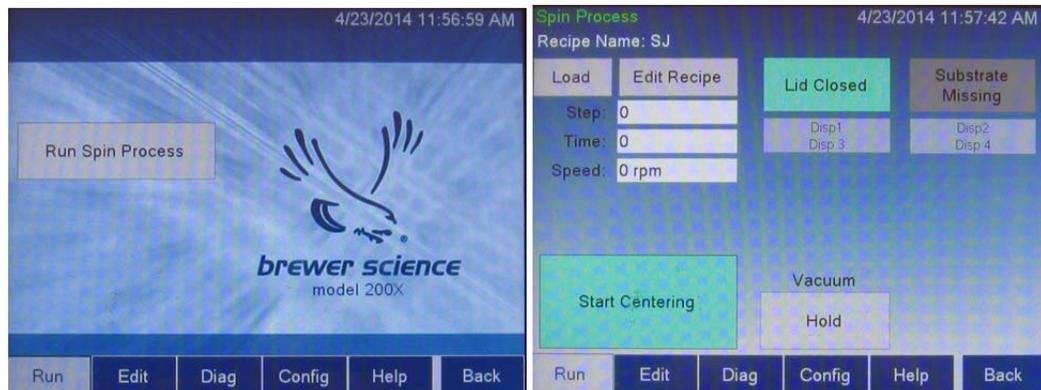


Figure 3

- Click on the “Load” button to load your recipe. Then the recipe is ready for use.

## 5.2 Load sample and run recipe

1. Take some aluminum foil from the shelf at the left of the refrigerator, and make a liner to the spinning bowl, as shown in Figure 4.

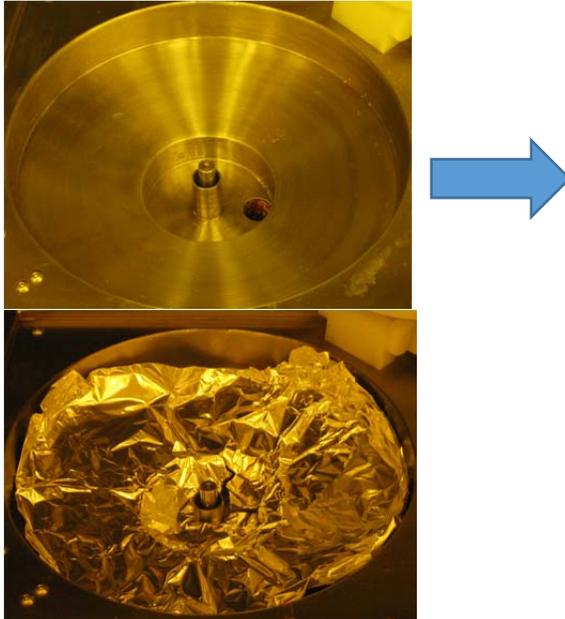


Figure 4

2. Choose the right spin chuck for your sample (Figure 5). Your sample should cover all the vacuum grooves and holes on the spin chuck. Install the spin chuck by aligning the pin on the spinning rod to the inside notch in the spin chuck (Figure 6). Tighten the screw if it is needed (Figure 7).

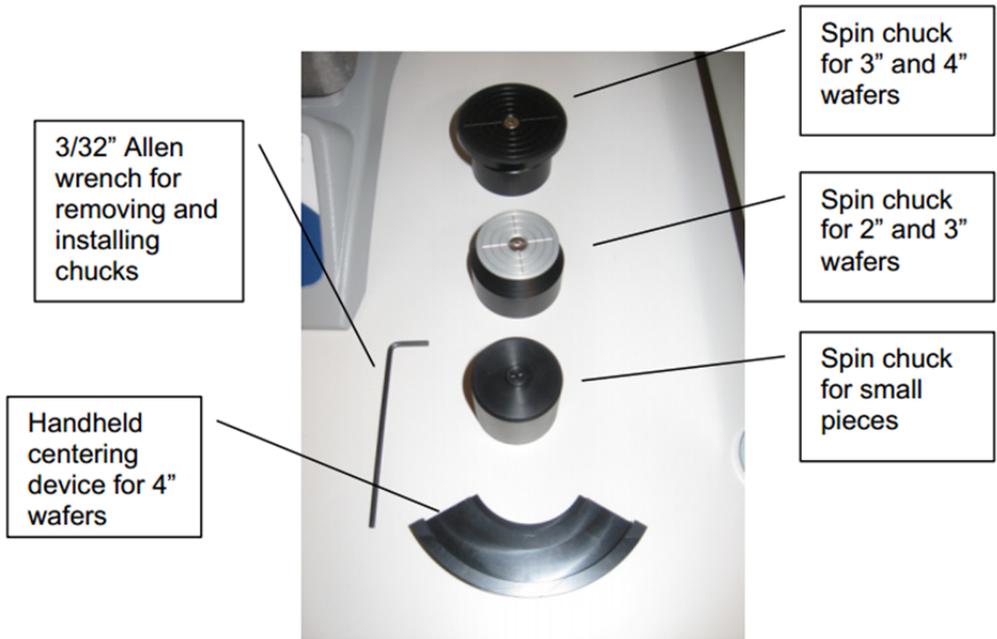


Figure 5

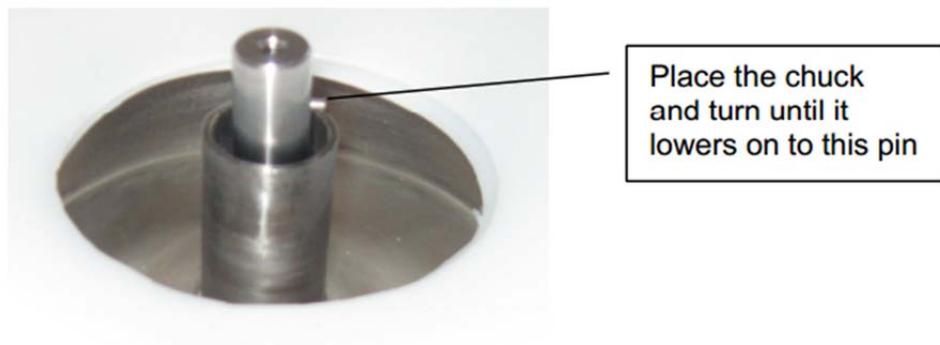


Figure 6

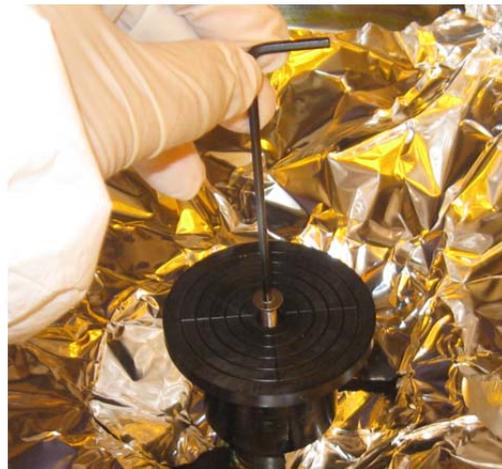


Figure 7

3. Put your sample on the sample holder. Do your best to put it at the center. Be sure that your sample can cover all the vacuum holes and grooves, otherwise you have chosen the wrong spin chuck. For 4" wafers, the arc-shaped plastic tool can be used to center a wafer.
4. Go to the touch screen, click on the "Start Centering" button to check the centering of your sample. If the centering is not good enough, you can click on the "Release" button to release your sample. After working on centering sample, click on the "Hold" button to hold sample. And you can check the centering again by clicking on the "Center" button.
5. Dispense your coating material, e.g. photoresist, to the center of your sample using a pipette. Do your best not to introduce air bubbles to the coating material. Discard the pipette into the sharp waste container.
6. Close the lid of the spinner. Go to the touch screen, click on "Start Process" to start coating recipe. After it is finished, a big sound will arise. Click on "OK" on the touch screen to acknowledge it.
7. Open the spinner lid and take the sample out. Put it on the baking hotplate if a baking process is needed.
8. Take out the spin chuck and discard the contaminated aluminum foil to the waste bin in the hood.

### 5.3 Clean spinner after use

1. Clean the spinner bowl and lid using acetone and wipes after every use. Do NOT directly spray acetone into the bowl. It will ruin the spinner. Spray acetone onto wipes. Then use wipes to wipe off any stains on the spinner bowl and lid. Discard the contaminated wipes into the waste bin in the hood.

## 6 Operating procedure for hotplates

### 6.1 For the constant temperature baking hotplates

1. Find the hotplate you want to use, and turn the power ON to that hotplate by switching its power switch to ON (Figure 8).



Figure 8

2. After few seconds, numbers will be displayed (Figure 9). The red number represents the current hotplate temperature. The green one represents the temperature setting. To change the temperature setting, push the “up” or “down” triangle button. The temperature ramp rate is set at 30 °C/s. It needs several more minutes to stabilize the temperature after it reaches the temperature setting.



Figure 9

3. There is a timer on the hood (Figure 10). On the timer, the red number represents how many seconds is left. And the green number represents the time setting. To set the time, press the button labeled 1, 2, 3, or 4. Changes can be seen to the green number. To start the timer, press the Timer Enable button at the bottom of the timer. Once it reaches zero, a loud sound can be heard. Press the Timer Enable button again to acknowledge it.



Figure 10

## 6.2 For the programmable hotplates

The programmer function of the CAL 9500 thermostat allows users to store programs which need temperature setpoint changes over time. An example program is represented in Figure 11.

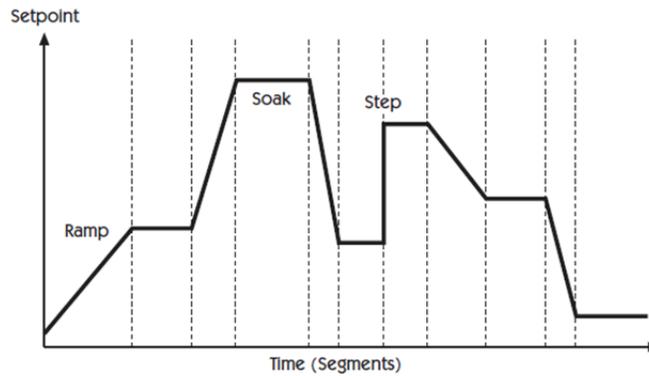
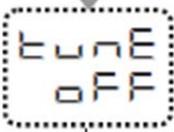


Figure 11

### 6.2.1 To Run a program

1. Press and hold  for 3 seconds.
2. When  shows on the display, press  and   
together for several times, until  is shown on display.
3. Press  button once.
4. Then press  and  together to select the program number from the PROG list.
5. Press  button once again.
6. Then press  and  together to select the Run/ON option.
7. Press  and hold for 3 seconds to exit configuration mode and run the program.

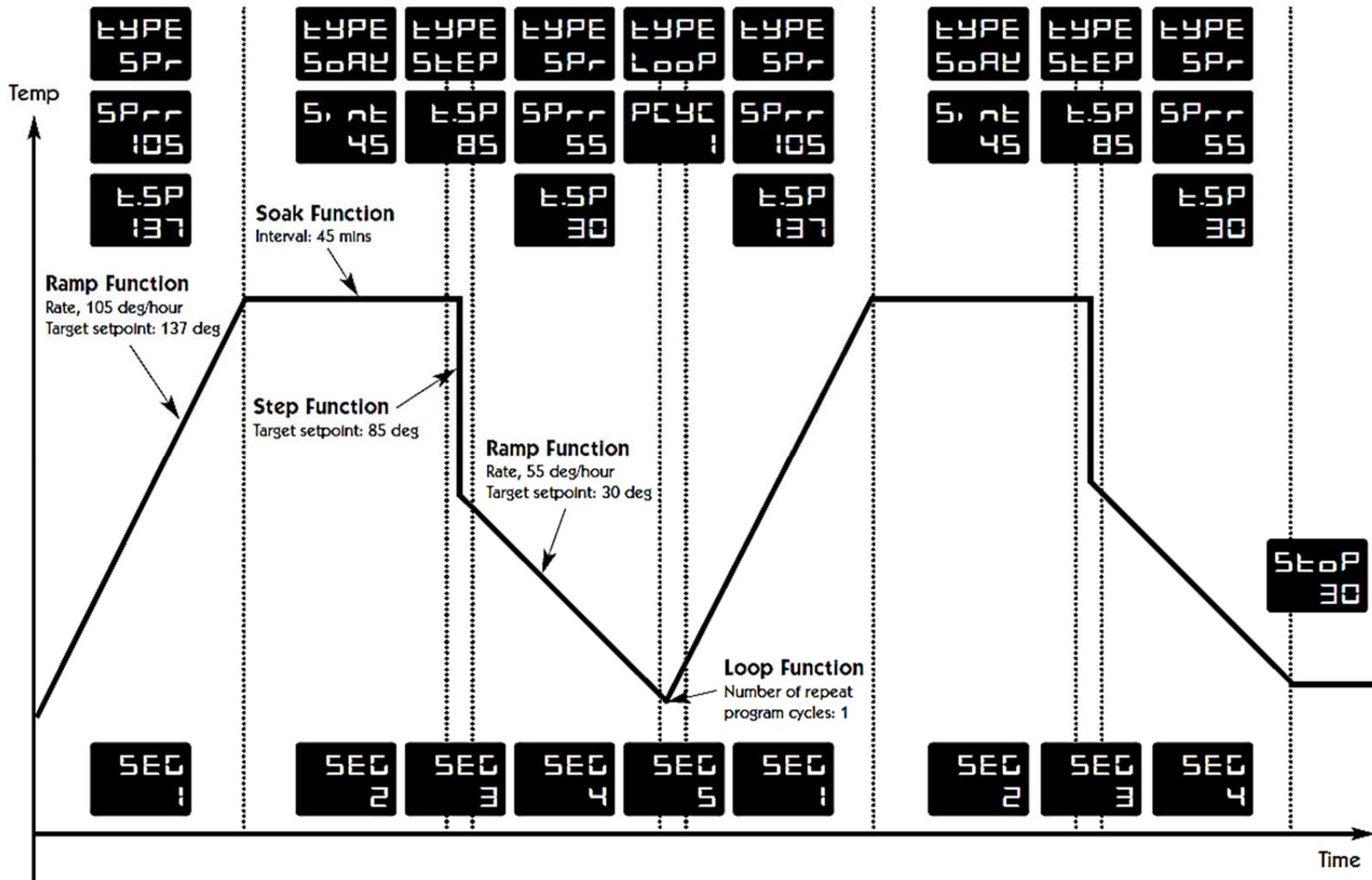
### 6.2.2 To hold a program

1. Press  and , and hold for 3 seconds to hold the program.
2. Press  and  again, and hold for 3 seconds to run the program from hold status.

### 6.2.3 To edit/create a program

Please follow the example program to learn how to edit a program.

#### EXAMPLE PROGRAM



**PROG 3** See segment configuration of this program detailed on page 18.



