

University of Minnesota Nano Fabrication Center

Standard Operating Procedure

Equipment Name: CEE resists spinners

Coral Name: spinner-2
Model: Model 100
Location: Bay 2

Revision Number: 1
Revisionist: K.Burkland
Date: 03/24/05

1 **Description**

The two CEE spinners are programmable spinners used for applying mainly photoresist uniformly on a substrate. Spin speed and length of spin time can be altered to achieve desired photoresist thickness. See the posted graphs for the Microposit 1805, 1013 1818, 1045 and 1075 photoresist spin curves.

2 **Safety**

- a Close the system cover prior to spinning to prevent the sample from shattering and being propelled through the air and causing an injury.
- b Do not change the CONF button. This is the motor control system parameters and will change all programs.

3 **Restrictions/Requirements**

- a Completed the Photolithography short course.
- b Which spinner to use:
 - CEE-1: Shipley 1805, 1813, 1818. Shipley 1045, 1077, AZ 9260, Futurrex
 - CEE-2: Lift Off Resist (LOR), Spin on Glass, SU8
- c Do not spin masks
- d Do not program any spin speed higher than 6000 rpms with an acceleration of 30,000 per the manufacturer .

4 **Required Facilities**

- a 120 Volts AC 300 Watts
- b Vacuum 25" Hg
- c Spinner exhaust: 1"
- d Drain ¾"

5 **Definitions**

- a LOR - Lift Off Resist
- b SOG – Spin On Glass

6 **Setup**

7 **THE ONLY ALLOWABLE CHEMICALS TO SPIN:**

- **CEE-1: Shipley 1805, 1813, 1818. Shipley 1045, 1077, AZ 9260, Futurrex**
- **CEE-2: Lift Off Resist (LOR) Spin on Glass SU8**

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Changing cups:

- 1 Raise the lid and remove the silver ring holding the cup liner in place and set it aside.
 - 2 Remove the chuck: Use the 3/16 Allen wrench into the screw and rotate right until it is removed. **DO NOT DROP THE SCREW INTO THE CEE!** Pull the chuck **STRAIGHT UP** until it is off.
 - 3 Remove the current liner and replace it with the desired liner.
 - 4 Reattach the chuck, replace the screw and rotate **LEFT**. **DO NOT OVERTIGHTEN!** The screw just needs to be snug.
 - 5 Replace the silver ring onto the cup liner.
 - 6 Ensure the spinner is working properly when a cup change is complete. Spin a non-essential silicon wafer prior processing your samples.
- b. Use the Red button on the control panel to turn the spinner **ON**.
- c. Programs 1 – 4 are pre programmed on CEE-1 as follows and are not to be altered:

PROGRAM	SPIN SPEED (rpm)	TIME (SECONDS)
1	2500	30
2	3000	30
3	3500	30
4	4000	30

- d. How to program a new program
- 1 Press **PROGRAM** key
 - 2 Enter program **NUMBER** # (5 – 9) on CEE-1, any # on CEE-2. Press **ENTER**.
 - 4 Enter the **Spin Speed** – not to exceed 6000 rpm. Press **ENTER**.
 - 5 Enter the **RAMP RATE** (acceleration rate) Press **ENTER**.
 - 6 Enter the **SPIN DURATION**. (0-999) Press **ENTER**.
 - 7 To end the program **END PROGRAM**, press **CLEAR** when VEL/1 (velocity) step is displayed.
 - 8 To **EXIT** the program *without* saving the changes press **RESET**.

8 Operating Instructions

- a Use the Red button on the control panel to turn the spinner **ON**.
- b Press the **RUN** key.
- c Enter the program # to be used.
- d Place and center a 4 “ substrate on the chuck.
- e Press the **START** key.
- f The chuck will spin slowly for 2 seconds. Check your centering of the wafer and adjust if necessary. Press the 0 key to re-check the centering.
- g Dispense the desired amount of Photoresist onto the center of the substrate.
- h Close the lid.
- i Press the **START** key.
- j The wafer will spin until the programmed time is complete. The spinner emits a beeping noise until the finished substrate is removed.

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- k To spin another substrate using the same program, follow steps d-j.
- l Thoroughly clean the chuck after you have completed spinning all of your substrates with ACETONE and clean room wipes until the cup until there is no residual photoresist. Do not spray acetone on chuck center where the screw is, this will ruin the motor.

9 Problems/Troubleshooting

- a Vacuum error, poor vacuum. This may indicate:
 - 1 Substrate is not placed properly on the chuck. Reposition and re-spin wafer.
 - 2 The screw holding the chuck is not properly installed.
 - 3 Lack of facilities vacuum. Notify maintenance personnel.