Start Up

1. Enable the CEE APOGEE Bake Plate on the TNFC Access System.
2. Turn ON the machine using the button on the right.
3. Login using the following credentials Username: admin Password: admin2
4. Confirm that the system is ready for operation by navigating to Tools>Manual Control:
   - Plate temperature: ~20 °C
   - Lift pin height: 5.0 mm
   - Ambient Temperature: ~22 °C
   - Humidity: ~31-32%
5. Confirm that the system is ready for operation by checking the gas valves:
   - Main nitrogen gas valve: Optional (ONLY open when proximity bake is needed)
   - Hood nitrogen valve: Optional (ONLY open when hood Nitrogen purge is needed)
   - Vacuum pump: Optional (ONLY turn on the pump next to it when vacuum bake is needed)

WARNING: Bake Plate surface might be VERY HOT, BE CAUTIOUS.

REMARKS: The plate temperature at ~20°C is just a reference temperature for the idling state. The process can still start at any plate temperature just that there might be risk of incurring process variation.

REMARKS: The lift pin height (home) can be changed according to user preference. For example, users can set the home height to 0mm through Manual Control and the sample will be placed on the bake plate surface directly at the start of the process.

Bake Methods

6. Vacuum method (Hard contact)
   - Sample is held securely to the bake plate surface through applying a vacuum.
   - Uniform heating across the sample surface.
   - Applicable to samples where back side contact is NOT a problem.

7. Contact method (Soft contact)
   - Sample is held to the bake plate surface through gravity ONLY.
   - Less uniform and less efficient heating across the sample surface.

8. Proximity method (Proximity contact)
   - Sample floats (1-4mm) on the bake plate surface by a thin nitrogen gas layer.
   - Slower warm-up than contact bake methods
- Advantages when baking thick films where blistering would be a problem.
- A high degree of uniformity even for cambered, or warped samples.

### Making A New Recipe

1. Navigate to the Recipes Tab.
3. Name your recipe accordingly.
4. Set the **plate temperature** by typing in the input field.
5. Change the **time** and **process method** (lift pin height, bake method) accordingly.
6. Insert more steps using the “Insert” button if it is necessary.
7. Save the recipe after editing.

**REMARKS:** The default recipe editing mode is a relatively “simple” mode that only allows a single temperature target, users need to change to advance editing mode for purposes such as setting up a temperature ramp and holding at a certain temperature for a prolonged period.

### Advance Editing Mode

9. Click the “Advanced” button, a “!” is going to show up within the button, click again.
10. Insert a new step using the “Insert” button.
11. Click on the newly added step.
12. Change the control and the action accordingly.

**REMARKS:** The advance editing mode allows a high degree of freedom on controlling the process. Users can add multiple temperature target within a single process with ramping rate up to \(6^\circ C/min\). Users can also add fixed time delays to make the machine hold at a certain temperature according to their need. Changing pin height during the process is also possible.

13. Press “Update” to log the change and a new step will be created.
14. Organize the order of the steps using the “up” and “down” arrows.
15. Modify the tolerances and preconditions using their respective button if necessary.
16. Save the recipe after editing.

### Loading And Running Existing Recipe

17. Navigate to Recipes Tab.
18. Press **Update** to log the change and a new step will be created.
19. Organize the order of the steps using the “up” and “down” arrows.
20. Modify the tolerances and preconditions using their respective button if necessary.
21. Save the recipe after editing.

**TORONTO NANOFABRICATION CENTRE**

*Please refer to the APOGEE™ Bake Plate Operations Manual for more details.*
25. Press “Load”.
26. Click on the designated recipe name.
27. Press “Run”.
28. Start the process using the “Start” button on the main Process Tab.

Loading A Sample

29. Open the hood using the handle.
30. Align and place the sample on the lift pin.
31. Close the hood slowly and gently.
32. Turn on the hood nitrogen valve if nitrogen purging is necessary.

Sample Unloading

33. Once the process is completed, the machine will make a beeping noise.
34. Check the bake plate temperature from Tools>Manual Control.
35. Turn off the hood nitrogen purging valve if it was opened.
36. Open the hood ONLY when it is cooled down to a safe temperature.

WARNING: The hood handle might be HOT when the interior temperature is HIGH, BE CAUTIOUS.

REMARKS: It may take some time for it to cool down, please BE PATIENT.
37. Remove the sample from the bake plate.

Shut Down

38. Confirm that the gas valves & vacuum are off:
   - Main nitrogen gas valve: OFF
   - Hood nitrogen valve: OFF
   - Vacuum pump: OFF
39. Logout from the bake plate by admin>Log Out.
40. Turn OFF the machine using the right button.
41. Disable the CEE Apogee Bake Plate on the TNFC Access System.

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Please refer to the APOGEE™ Bake Plate Operations Manual for more details.