AW610 Rapid Thermal Process system SOP

1. Scope
   1. This document contains information on how to operate the AccuThermo AW610.

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1. Reference Documents

Referenced within this Document

* + 1. AccuThermo AW610 Rapid Thermal Process System Operation Manual.
    2. AccuThermo AW610 Rapid Thermal Process System Technical Manual.

External Documents

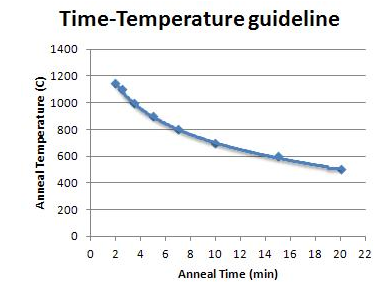
* + 1. None



1. Equipment Overview

The AccuThermo RTP system is a rapid thermal processing system, which uses high intensity visible radiation to heat single wafers for short process periods of time at precisely controlled temperatures. The process periods are typically 1-600 seconds in duration, you must receive staff approval for a longer duration.

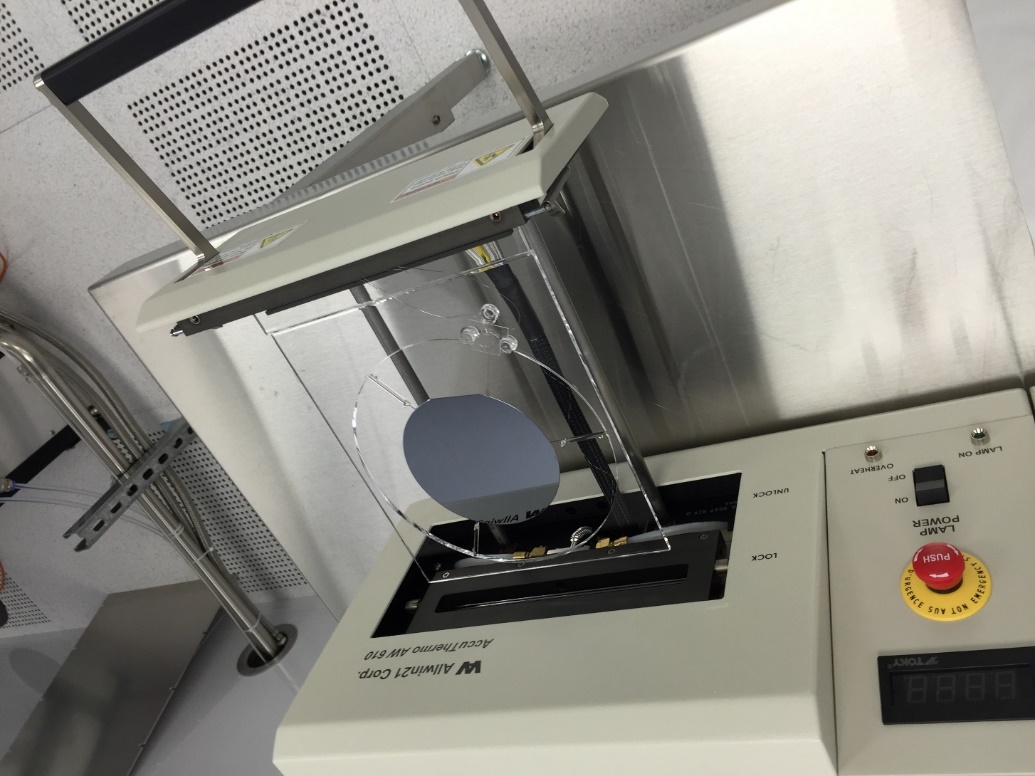
1. Safety
   1. Follow all Nanofab safety procedures
   2. **Guidelines for Time-Temperature**
      1. The system is not capable of doing long anneals over extended periods of time, especially at higher temperatures. The following chart should serve as a broad guideline in determining allowable anneal time for the required temperature (roughly log dependence.) When in doubt, contact the staff before you run a new recipe.

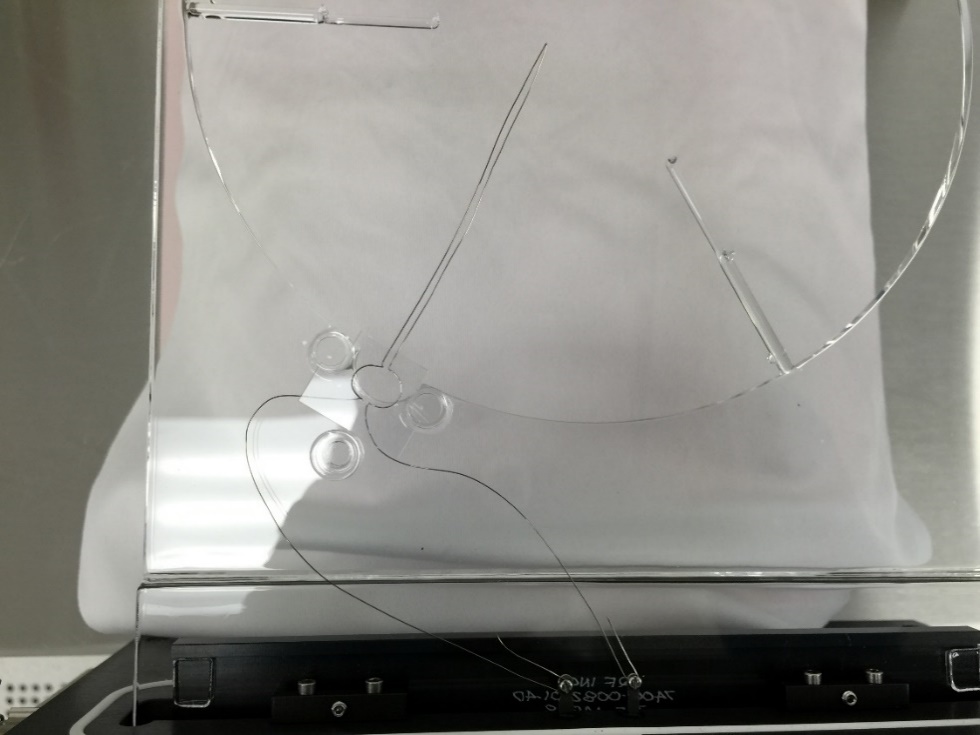
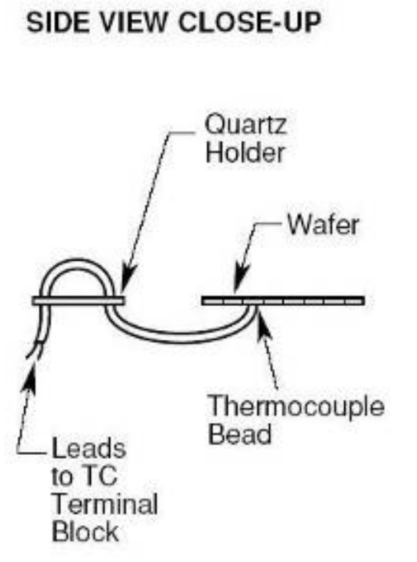


1. Process A Wafer

How To Process a Wafer

* + 1. Contact a staff member prior to making a recipe. Staff must create/approve ALL recipes
    2. To log in, type a 5 in “User ID.” The username NanoFabUser should display automatically Type the password USR
    3. Starting from the main menu, click “Process for Production”
    4. On the left side of “DIR ID,” select USER
    5. For “lot ID” select your username. If you do not have a username, type what you want your username to be and it will create it automatically
       1. This is where all of your files will be saved
    6. Select the recipe you plan to run
       1. If more than one wafer is being processed, select the amount by clicking “wafer ID”
       2. If your wafer is transparent or if you have wafer shards, proceed to section 7.1
    7. Ensure the correct temperature measurement sensor is in place
       1. Contact staff if the thermocouple needs to be installed or removed
       2. Thermocouple is used for processes below 700°C
       3. Pyrometer is used for processes between 550°C and 1150°C and the thermocouple must be removed above 700°C
    8. Load your wafer by pulling the lever down to the unlock position and then pulling it forward
       1. No wafer with photoresist, polymers or any other toxic or high vapor pressure material are allowed in the chamber
    9. Once it is opened, you may carefully set your wafer on the quarts tray fingers



* + 1. If using the thermocouple, insure it is in contact with the bottom of the wafer
    2. Close the chamber. Confirm the lever is in the locked position
    3. Turn lamp power on
    4. Run the recipe by clicking on the “Start process” button
    5. The computer will start the recipe automatically and display a graph on the monitor showing a live feed of data
    6. The screen will show “PROCESS OVER” once the final step has ended. You can click “SAVE EXIT” or “STOP NOT SAVE”
       1. Watch the LED display on the front of the RTP and wait until shows .050, which represents 50°C
          1. This only works when using the thermocouple
       2. Or wait 2 minutes minimum after the start of the cooldown and with metal tweezers, remove the wafer and place it onto foil for the final cooldown
          1. Wait minimum of 4 minutes when using the susceptor
    7. Open the chamber door and take out your sample
    8. Close the chamber door and turn off the lamp power

1. Susceptor

How to use the Susceptor

* + 1. If you are using a glass wafer, some other form of transparent wafer, or a part/shard of a wafer you must load it into the susceptor
       1. If you set parts of a wafer on top of a regular wafer, it will move around during the process
    2. Carefully open up the susceptor and set your wafer inside
    3. Carefully close the susceptor with your wafer inside
    4. **When loading the susceptor into the chamber, ensure the numbers are facing upwards**
    5. Resume to step 6.1.6

1. Creating And Editing A Recipe

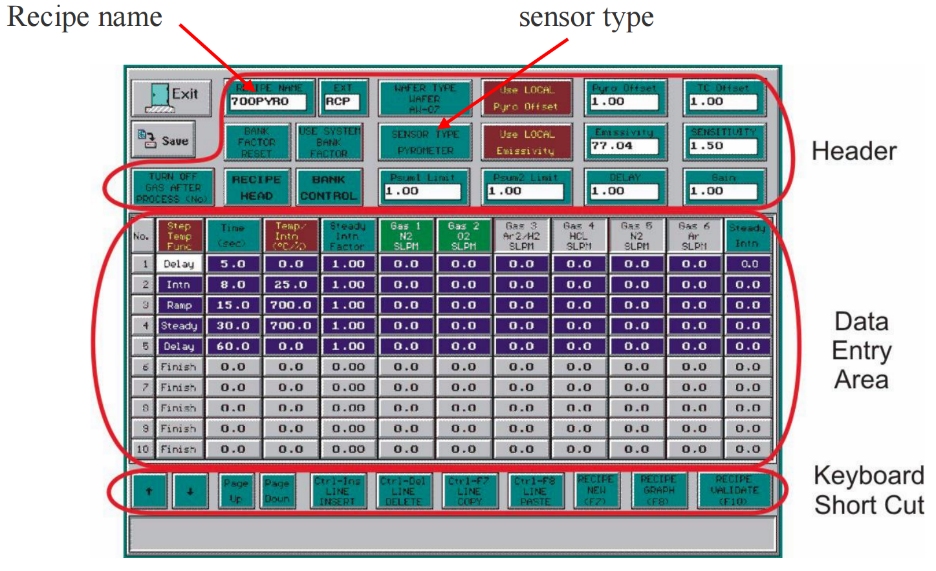
How to Create or Edit a Recipe

* + 1. Contact a staff member prior to making a recipe. Staff must create/approve ALL recipes.
    2. Starting from the main menu, click “Recipe” and select a pre-existing recipe
    3. Click on the “Recipe Edit” button to display the recipe editor
    4. Edit it (If a new recipe is being created, just change the recipe name field before saving it.)
    5. If using the pyrometer as the temperature sensor device, then create an intensity step before the first ramp step. Set all the tuning parameters to 1.00 (gain, sensitivity and delay)
    6. To avoid cracking the susceptor, the maximum ramp rate is 20°C/second
    7. Click on “Recipe Head” to confirm RTP is set on the current calibrations

Current calibration names: Updated name, next cal

PYRONAME 160930\_3.WFR or SPT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CHAMCALI LAMPCAL.WFR or SPT \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + 1. Save the recipe with .RCP or .SPT, SPT for susceptor recipes.
    2. exit the recipe editor
    3. **All recipe’s must be approved by qualified staff before running a process**

1. Daily Power-up & Power-down Procedures
   1. **Daily Power-Up**
      1. Ensure all gas valves are turned off
      2. Verify there is no restriction to the process or cabinet exhaust and that they are set to the proper pressure and flow rate
      3. Turn on the chamber cooling water
      4. Turn on the quartz isolation tube cooling CDA/nitrogen.
      5. Enable the lamps using the front panel Lamp Power switch. The green Lamp ON light indicates the lamps are enabled. You will also hear a "clunk" when the switch is turned on. This is the sound of the contactor engaging
      6. Open the chamber door about 1 cm. This will ensure the quartz chamber will not over pressurize if there is a problem with the gas system
      7. Turn on the gas valves
   2. **Daily Power-Down**
      1. Make sure it has been at least 5 minutes since the last use or until the chamber has cooled to room temperature
      2. Turn off the gas valves
      3. Turn off the oven unit LAMP POWER switch
      4. Turn off the quartz isolation tube cooling CDA/nitrogen

If any accessories are being used with the system, turn them off as necessary

1. Warnings

|  |  |  |
| --- | --- | --- |
|  | **WARNING**   * **Long, high temperature processes may damage the AccuThermo RTP system** * **Make sure both water cooling and air cooling are on before running any process** * **Quartz is very delicate, handle with care** |  |

1. Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Rev | Date | Originator | Description of Changes |
| 1 | 12 September 2016 | Tysen Heaton | Created SOP |
|  |  |  |  |