

RTA-EML

STANDARD OPERATING PROCEDURE

CORAL NAME: RTA-EML

MODEL: AG ASSOCIATES HEATPULSE 210

LOCATION: EML

WHAT IT DOES: RAPID THERMAL PROCESSING

INTRODUCTION:

The system can run a large variety of substrates.
New materials require the PTC approval for safety reasons.
It is an old hot Quartz walls system running up to 4" wafers under K-type
Thermocouple control only.
Temperature range: 300-900 C
Maximum run time: 300 sec
Maximum ramp up rate: 30C/sec

Gases:

Nitrogen, Oxygen and Forming Gas: 5%H₂ in 95% N₂
RTA-EML uses a Rockwell controller for running a one-step process in a
Menu-Driven control mode.

Safety:

- Parts inside the chamber could be very hot; avoid direct contact.
- The Forming Gas (5.5%H in 95% N₂) MSDSs can be found in the binders located in lab areas & in the Web.
- Forming gas must run without mixing with Oxygen.
- Do not open chamber when it's hot, to avoid potential generation of toxic gases from certain substrates.

Procedure:

1. Engage the RTA-EML in Coral.
2. Contact the EML staff prior to using the tool to get help with new materials & related allowed run-parameter limits, as well as required pre-cleaning and other operation issues.
3. Open the cooling water using the manual valves located on the lab wall to the left of the RTA.
4. Set the N₂ flow at the 50 mark on the flow meter to the right of the tool; open the the chamber by pulling out the wafer tray load assembly and place your sample on

- the TC wafer, if possible place the GaAs like sample face down to limit As emission.
(The sliding wafer tray assembly is very fragile: handle it with care.)
5. Close the chamber, wait ~ > 1 minute to purge the system with Nitrogen and set the flow of the desired gas to 25 mark on the needle flowmeter.
 6. Check that controls on the machine front panel are in the following positions:
 - LAMP CONTROL: Auto
 - METER SELECT: OFF
 - LAMP INTENSITY: Turned OFF completely counterclockwise.
 7. Turn ON the machine and the controller.
 8. Press the small RESET button on the back left side of the controller and press any key. The Main Menu will display:
M, A, S, T, L, C, D, U ?
Press S key to set up process parameters:
The display then reads:
SET A (TIME), T (TEMP), M
Press A key to input the steady state anneal time up to 300sec, and then RETURN.
Press S key again to go from the Main menu to the parameter set mode.
Press T key to set the steady state anneal temperature (between 300-900C);
Press RETURN.
You are back in the Main menu now.
Optionally Press L to get a listing of process parameters before starting the run.
Press A key (from Main Menu) to start the setup process in Automatic mode.
(if there is a problem coming back to the Main menu anytime, press the RESET button, and start the parameter setup procedure again)
 9. The run will proceed and the temperature value will be displayed divided by 10.
 10. Wait for the temperature value to get below 100C under increased Nitrogen flow, before opening the chamber and removing your sample.
 11. Close the chamber door.
 12. Turn OFF the machine power.
 13. Turn OFF the cooling water.
 14. Set up the N2 flow to 5 mark to keep the Quartz chamber purged.
 15. Disengage the machine in Coral.

Kurt Broderick

Bernard Alamariu

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