

tube5B-anneal

STANDARD OPERATING PROCEDURE

This equipment donated by Intel

CAFE Name: tube5B-anneal

Model: Thermco Atmospheric Furnace
Number:

Location: ICL

What it does: Atmospheric furnace

Introduction: THERMCO "tube5b-anneal" Furnace is an Atmospheric furnace designated to grow thermal Silicon Dioxide in the temperature range of 800 – 1100 C, on Silicon wafers up to 6 inch in diameter. Other CMOS compatible thermal processes could run too. The system is equipped with an internal Pyrogenic torch and the Pyrogenic reaction is allowed for temperatures higher than 800C only. The system is designated for high temperature anneal and grow of thermal SiO₂ films in the thickness range of 20A to 5000 A: the internal injector configuration makes difficult for the furnace to grow thick uniform thermal oxides. This furnace has a 40" long flat temperature profile within +/- 1C.

The following gases are available:

Nitrogen: 20 SLM

Oxygen: 20 SLM

Oxygen: 2 SLM

HYDROGEN: 20 SLM (interlocked with Oxygen flow)

TCA (C₂H₂Cl₂): 500 sccm (interlocked with Oxygen flow)

The THERMCO furnace is controlled by the TMX tube computer; while the SEMY supervisor system is

used to monitor the system and to edit and store the process recipes.

The THERMCO "tube5b-anneal" horizontal furnace is for CMOS process only.

Safety: The system has hardware and software safety interlocks, to prevent any Hydrogen related hazard.

High temperature: many furnace parts can be hot. Use caution when handling them.

- Procedure:
1. Do "Engage" command in CORAL for ICL "tube5b-anneal" machine, before you start. The wafers should have been RCA cleaned less than 4 hours before and your process must be approved by the PTC.
 2. Pull the tube boat out as follows:
 - On the SEMY terminal double click on "RUN" ; the "Minispec Loader" pops up on the screen.
 - From the OPTION/ TUBE menu choose "5B"
 - Click on File/Open menu , select the " BOAT_OUT" minispec and click OK
 - On Minispec Loader window click "Compile & Send"; Compile Status window will be show up. Wait until the OK button is active, then click on it: the recipe was successfully sent to the TMX tube computer.

Note: The tube should be in "Standby" mode to accept a new recipe; if it is in "Complete" status, push the "STOP" button on the tube TMX display to bring the system in " Standby " mode. Open the Tube Status from the Semy pallette; from Option/Tube select "5B", and from Display select Detail. Check in the right top corner if the "BOAT_OUT" minispec was downloaded to the tube; the minispec listed there will be processed when you will push the START button.

 - On the tube TMX display push the "START" button; the system will go in Processing mode, and the boat will come out in 10 minutes.
 3. Pull the central quartz boat from the tube paddle Using the pick up tool, place it on the designated 5B transfer quartz plate, and place your wafers and the monitors in the quartz boat. Place the quartz boat back in the central position on the tube paddle, with the wafers front side facing the Load Zone

end.

4. Start the processing recipe, by following these steps:
 - On the SEMY terminal double click on "RUN" icon; the "Minispec Loader" pops up on the screen.
 - From the OPTION/ TUBE menu choose "5B"
 - Click on File/Open menu , select the minispec and click OK. (For example if you want to do a 1000C variable time wet oxidation select "2W1000" minispec, or "2D1000" minispec for a dry Oxidation, variable time process at 1000C, etc)
 - On Minispec Loader window click "Compile & Send"; the Compile Status window and the Variable Delay Entry window will show up. On the Variable Delay Entry window input the deposition time and push "ENTER", input the deposition time again to confirm and wait until the OK button on the Compiler Status window is active, then click on it: the recipe was successfully sent to TMX tube computer.

Note: The tube should be in "Standby" mode to accept a new recipe; if it is in "Complete" status, push the "STOP" button on the tube TMX display to bring the system in " Standby " mode. Open the Tube Status from the Semy pallete; from Option/Tube select "5B", and from Display select Detail. Check in the right top corner if the right minispec was downloaded to the tube; the minispec listed there will be processed when you will push the START button

- On the TMX tube display push "START" button, the system will go in "Processing" mode.
5. When the process is finished, take the quartz boat from the tube paddle, Using the pick up tool and place it on the designated transfer quartz plate. Remove your process wafers and monitor wafers from the quartz boat. Place the quartz boat back on tube paddle and put the boat in by following these steps:
 - On the SEMY terminal double click on "RUN" icon; the "Minispec Loader" pops up on the screen.
 - From the OPTION/ TUBE menu choose "5B"
 - Click on File/Open menu , select the "BOAT_IN" minispec and click OK
 - On Minispec Loader window click "Compile & Send": the Compile Status window shows up. Wait until the OK button is active, then click on it: the recipe was successfully sent to the TMX tube Computer.

Note: The tube should be in "Standby" mode to accept a new recipe; if it is in "Complete" status, push the "STOP" button on the tube TMX display to bring the system in " Standby " mode. Open the Tube Status from the Semy pallete; from Option/Tube select "5B", and from Display select Detail. Check in the right top corner if the "BOAT_IN" minispec was downloaded to the tube; the minispec listed there will be processed when you will push the START button

- On the tube TMX display push the "START" button; the system will go in Processing mode, and the boat will start going in.
6. "Disengage" session in CORAL, after you input the test data from the monitor wafers into the comments section.