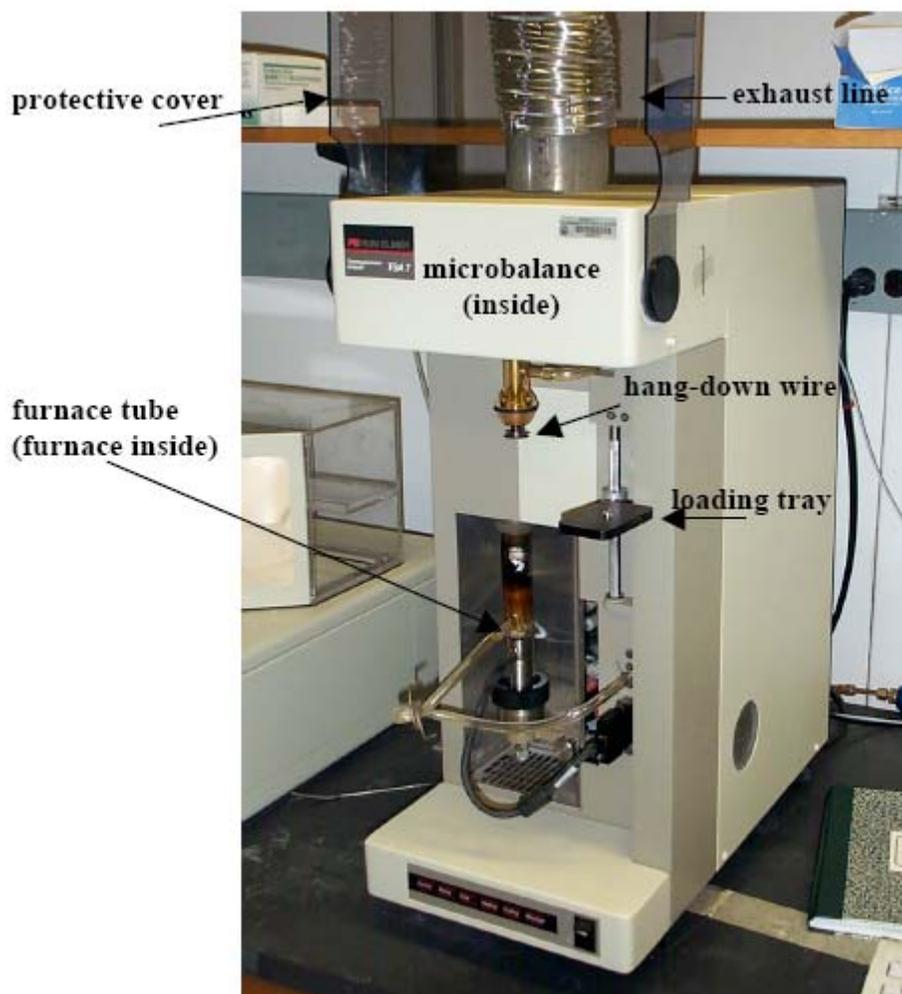


Instrument Operation Instructions

Department of Materials Science & Engineering

Equipment:	Perkin Elmer TGA 7 – Thermogravimetric Analyzer
Location:	3364 Hoover Hall
Access:	Open for undergraduate coursework
Contact:	Ilkay Kalay

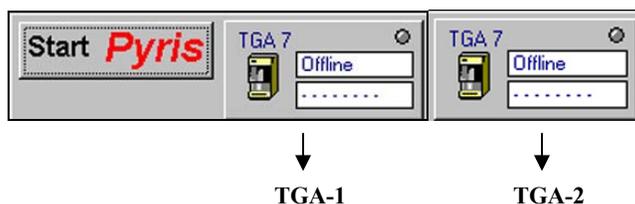
The Perkin Elmer TGA 7 (Temperature Range: Ambient -950 °C)



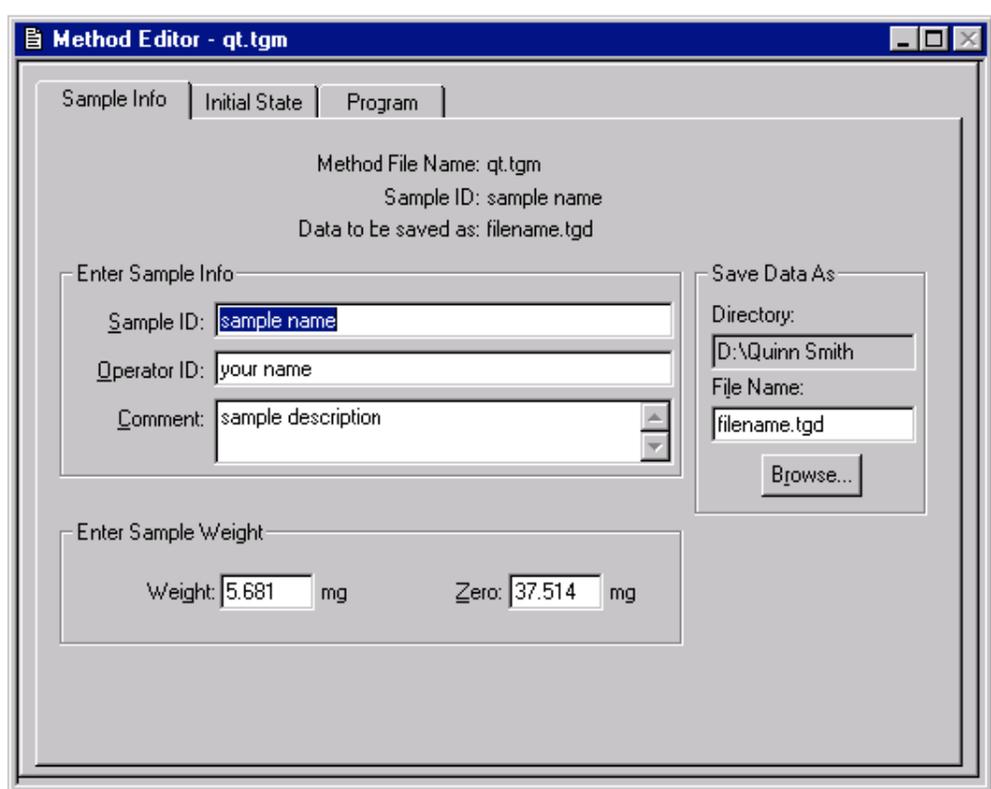
- **Please sign in the log book next to the computer.** Write down the date, your name, which instrument used (1 or 2), what material is being run, the sample purge gas, and the temperature schedule (range & heating rate). Also indicate how many runs are performed and any problems that occur.

➤ **Using TGA 7**

1. Turn on the valve on the Nitrogen cylinder
 - The delivery pressure should be 35 psi.
 - The tank pressure should be higher than 100 psi for longer runs.Turn on the valve on the Air cylinder
 - The pressure should be 40 psi.
2. Log onto the computer using your ISU account.
3. Double click on Pyris Manager on the desktop to open the Pyris program.
4. Log onto accounting program using your CLUE account. The upper left-hand of the screen will have icons for both TGAs – double click on the one that corresponds to the machine you intend to use to start the instrument control software.



5. Open the “Method Editor” window.



6. Click on “**Sample Info**” box
 - Enter in the name of the sample
 - Enter your name in the operator’s name
 - Enter any comments about your sample
 - Place the cursor in the File Name box and click on browse.
 - Move to the folder in which you would like the data to be saved
 - Choose a descriptive file name
 - Click on save
7. Click on the **Program** button in the method editor window.
 - Click on add a step button and add a temperature scan.
 - Highlight the Hold for 1.0 minute and click on delete this step button and delete it.
 - At the bottom of the box, enter the final temperature for the scan (max of 950°C) and the heating rate desired for the experiment.
8. Click on the “**Initial State**” button
 - The baseline subtraction should not be selected.

➤ **Starting an experiment**

9. The run experiment button should be like  , if it looks like  as non-communication, then click on this button.

10. Go to the **gas control station**
 - Enter the following sequence: run – manual – N₂(nitrogen) or Air – start
 - Just push the button below each option

➤ **Tare the sample pan**

10. - Place the empty sample pan in the holder on the loading tray
 - Slowly move the loading tray over and up to the same height as the hook
 - Swing the platform underneath the hook and slide the pan hanger over the hook
 - Do not touch the wire!
 - Take the loading tray to its safe position.

11. In the software click on the **raise furnace** button. 

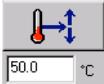
12. Check that the weight has stabilized and press the get zero weight (tare) button. 
This will zero the balance. The tare weight should be read in the ‘Zero’ box on the Sample Info window.

13. Lower the furnace by clicking on the lower furnace button  and carefully slide the pan and hanger off the hook.

➤ **Weight the sample**

14. Place the sample in the pan by using tweezers, micro spoon and spatula.
15. Raise the furnace. Also, swing the heat shield down into place.
16. Wait for the sample weight to be steady and then click on the weight sample button.
 The sample weight should be read in the 'Weight' box on the Sample Info window.

➤ **Run the experiment**

17. Enter the starting temperature and click on the 'Go to temp' button.

18. When reach to the starting temperature, click on the run experiment button and start your experiment.


➤ **After the experiment**

19. When the experiment is done, the furnace will automatically lower.
 - Take the sample pan from the hang-down wire
 - * Do not bend the wire and the pan
 - **Clean the sample pan** and place on top of the TGA.
 - * The sample pans are platinum;
 - Do not scratch the pan with sharp points
 - Almost any acids (*i.e.* HNO₃, etc...) or solvents can be used but also be careful not to bend the pan or hang down wire.
20. If you are the last to be using the TGA,
 - Close the software
 - Turn off all gases
21. Log off your account.