



**Parr Instrument Company**

**6100 Calorimeter  
Operation**

# Goal

- Learn how to run a test on a Parr 6100 Calorimeter with a standard 1108 Oxygen Bomb





**Warning!**

It is important that the Operating Instruction Manual be read and understood (**especially the safety instructions**) before using the calorimeter. Failure to do so could result in catastrophic failure.

# Step 1

- Turn on the calorimeter
  - The calorimeter will boot up to the main menu
- Turn on the Oxygen Supply



# Step 2

- Go to the Calorimeter Operation menu

The screenshot displays the 'CALORIMETER OPERATION' menu on a device. At the top right, the number '6100' is shown. The menu contains several buttons: 'OPERATING MODE' (with 'Determination' below it), 'BOMB / EE' (with '1 / 2400.0' below it), 'TEMPERATURE GRAPH' (with a small icon), 'START PREWEIGH', 'O2 FILL', 'ESCAPE', 'MAIN MENU', 'START', 'REPORT', and 'HELP'. Below the buttons, there is a list of data points: 'SAMPLE ID', 'SAMPLE WEIGHT 0.0000', 'SPIKE WEIGHT 0.0000', 'JACKET TEMPERATURE 24.6653', and 'BUCKET TEMPERATURE 24.2865'. The status 'IDLE' is shown at the bottom left, and a bright green horizontal bar is at the bottom center.

# Step 3

- Prepare a Sample
  - Tare a sample cup
  - Weigh a sample to the nearest .0001 g



# Step 4

- Put the sample on the head
  - Attach a fuse wire
    - The fuse wire should touch the top of a solid pellet
    - The fuse wire should not be buried in a powder or granulated sample
    - The fuse wire can touch a liquid sample or be positioned just above the surface of the sample



# Step 5

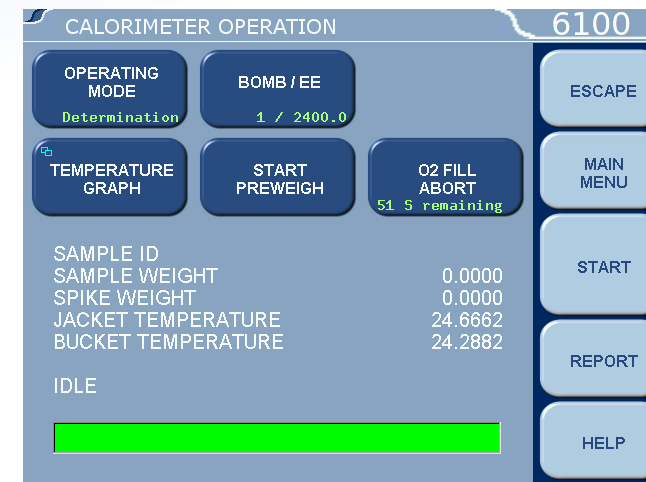
- Load the head into the bomb cylinder
  - Place the head into the cylinder
  - Screw on the cap as far as it will go and then back it off slightly. Do not over-tighten





# Step 6

- Place the Oxygen Fill Connection on to the 1108
- Press the O2 Fill button on the Calorimeter Operation screen
  - Oxygen will flow into the 1108
  - A timer will count down the fill time
  - Pressing the O2 Fill key while the timer is counting down will abort the fill process



# Step 7

- Fill the bucket with 2 liters (2000 ± .5 g) of water
  - Using the same amount of water each time is critical
- Place the bucket inside the calorimeter
  - Note: There are three plastic pieces in the bottom of the air can that line up with the depressions in the bottom of the bucket



# Step 8

- Using the bomb lifter position the bomb part way into the bucket
- Attach the ignition wires to the terminals on the 1108 bomb head
  - Try to avoid getting your fingers wet



# Step 9

- Lower the bomb the rest of the way into the bucket
  - Note that the bomb will sit on the embossed circle on the bottom of the bucket
- Observe the bomb to make sure that there are no oxygen leaks
  - Do **NOT** continue if there are bubbles coming from the bomb!



# Step 10

- Close the lid making sure that neither the stirrer or the bucket thermistor are touching the 1108 bomb or bucket



# Step 11

- Press Start
  - Input the Sample ID
  - Input the Bomb ID
  - Input the Sample weight
  - Input the Spike weight (if spiking is turned on)



# Step 12

- The test will automatically proceed through the following steps:
  - Pre-period Cycle
  - Fire the sample
  - Post Period Cycle

# Step 13

- Results
  - Once the calorimeter is finished with the post period cycle the results will print out on the printer or display on the touch screen
- Once the test results have been printed or displayed the calorimeter will be ready for the next test once the next sample is ready



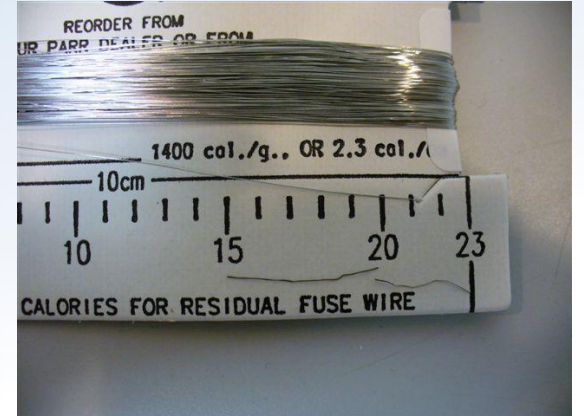
# Step 14

- Open the lid and remove the bucket with the bomb.
  - If another bomb and bucket combination is ready it may be put in at this time and go to step 8
- Remove the 1108 bomb from the bucket and release the pressure by loosening the valve knob.
  - If you are analyzing the bomb rinse water then release the pressure slowly (over not less than one minute) to avoid entrainment losses

# Step 15

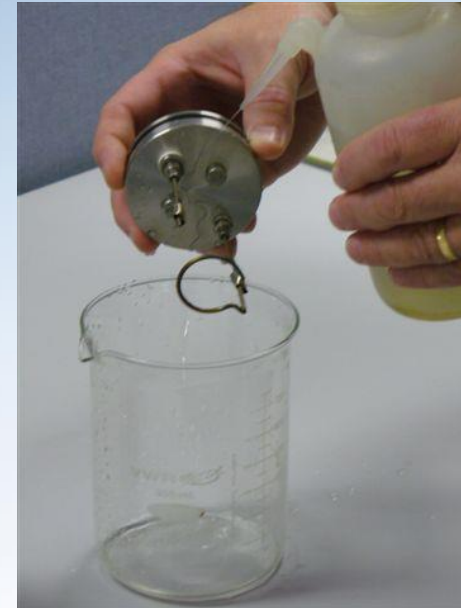
- Fuse correction determination\*
  - Remove the unburned remains of the fuse wire
    - Measure the unburned length and subtract from 10 cm
    - Multiply this by 2.3 cal/cm to get the result
    - The 45C10 Fuse Wire card may be used to directly measure how many calories the fuse wire contributed

\*This step can be skipped if you are using a fixed fuse correction.



# Step 16

- Rinse the bomb head and cylinder
  - Use distilled water and rinse thoroughly
  - Save the rinse water for further tests as required
- Dry the bomb head, cylinder and screw cap
- The bomb is now ready to prepare for the next test



# Where to get more Information

- Please refer to the 584M Operating Instruction Manual for the 6100 Oxygen Bomb Calorimeter and 205M Operating Instruction Manual for the 1108 Oxygen Combustion Vessel for additional diagrams and information.
- Operating Manuals can be downloaded from the Parr Instrument Company website ([www.parrinst.com](http://www.parrinst.com)), from your local Parr dealer, or by contacting Parr customer service directly at [parr@parrinst.com](mailto:parr@parrinst.com).



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