

Operating Instructions – Differential Scanning Calorimeter

Model and Manufacturer: DSC 6000, PerkinElmer

Safety:

- Wear gloves when operating the instrument.
- Inform the Core Facility staff for any safety issue or misuse of the instrument.

Note:

1. It is best to know your sample properties in advance. The maximum temperature of the test shall not exceed the decomposition temperature of the sample (to avoid irreparable loss caused by the pollution of decomposition volatiles to the testing furnace).

1. Sample preparation

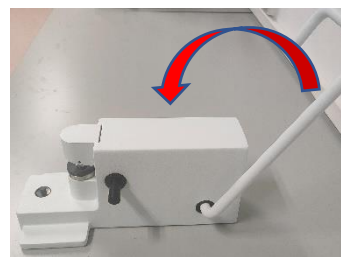
- 1.1 Weigh a sample of 3-6 mg.
- 1.2 Use tweezers to put the sample into the pan.
- 1.3 Cover the pan with its cover and put onto the black holder of the press instrument.
- 1.4 Rotate the lever of the sample press instrument to press your sample. (see picture below)



Pan and Cover



Black Holder with Pan



Sample Press Instrument

2. Hardware Start-up

- 2.1 Turn on the computer.
- 2.2 Open the main nitrogen gas valve (blue) in an **anti-clockwise** direction. Adjust the output valve (red circle) to keep the pressure within the range **0.15-0.25 MPa**.



Nitrogen Gas Cylinder



0.2 Mpa on Gas Output Meter

- 2.3 Turn on the DSC instrument by switching on the button behind the instrument. The power light should turn on.



Instrument Main Switch



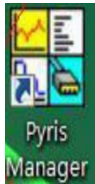
Power Light is On



3. Software Start-up

3.1 Double click on the **Pyris Manager** icon on the desktop to open the software.

3.2 Click the 'DSC' icon (red circle) to connect the software to the instrument.



Software Shortcut



'DSC' Icon



Temperature Display

3.3 After connecting the instrument, the temperature can be read on the top-left corner of the window (blue circle above) .

4. Create File and Program Settings

4.1 On the **Sample Info** tab, fill Sample ID, Operator ID, File Name and Sample Weight (See below).

4.2 Keep the **Initial State** tab with no changes.

4.3 On the **Program** tab:

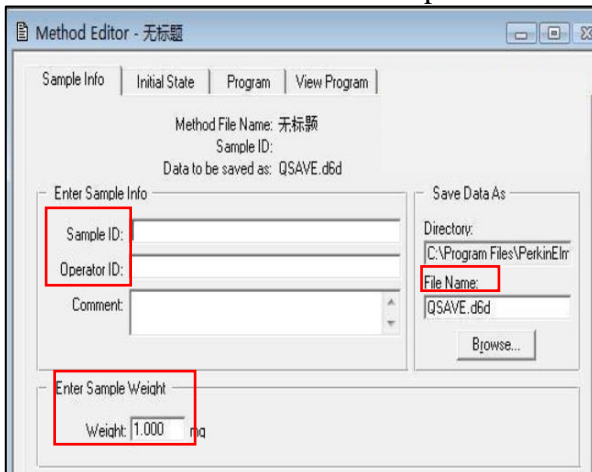
4.3.1 Fill the Initial Temp.

4.3.2 Click **Add a Step** and **Select a step** in the new window that appears. See example in the image below: Step 1: keep temperature at 30°C for 1min. Step 2: heat at 10°C/min from 30°C to 200°C.

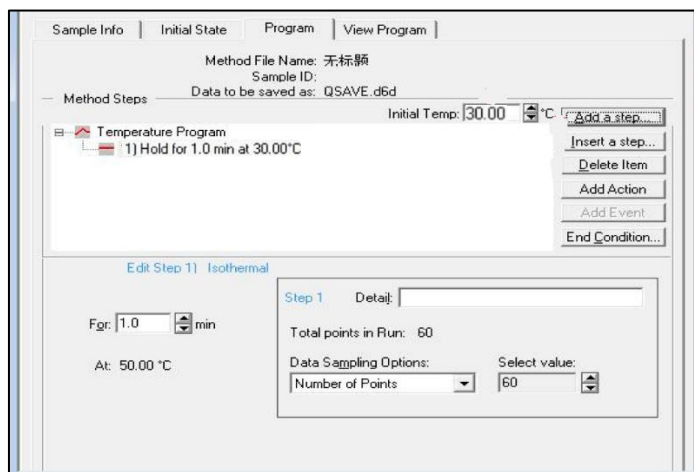
4.4 Click **Delete Item** to delete a step.

4.5 Click **View Program** to double confirm the program you have set.

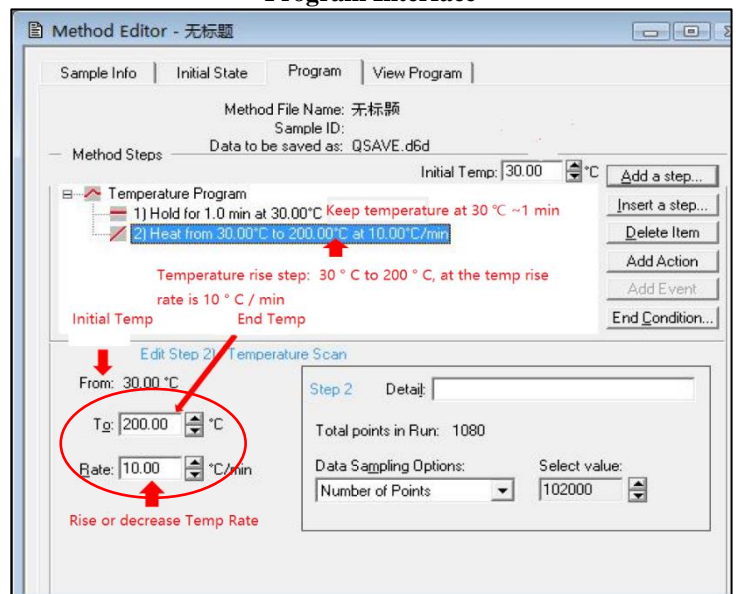
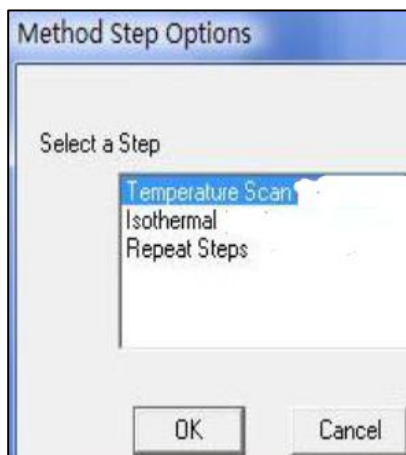
4.6 Save method: Click **File** on top left corner of the software and click **Save Method**.



Sample Info Interface



Program Interface



Select a Step

Program Example

5. Run Program

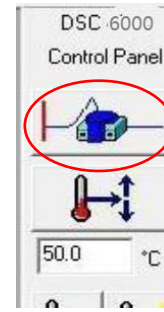
5.1 Move the lid of the sample placer. Put the pan with sample into an empty position



Sample Placer with Lid



Sample Placer without Lid



'DSC' Icon

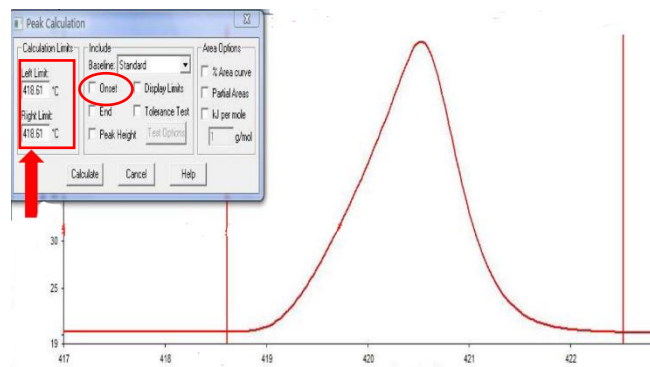
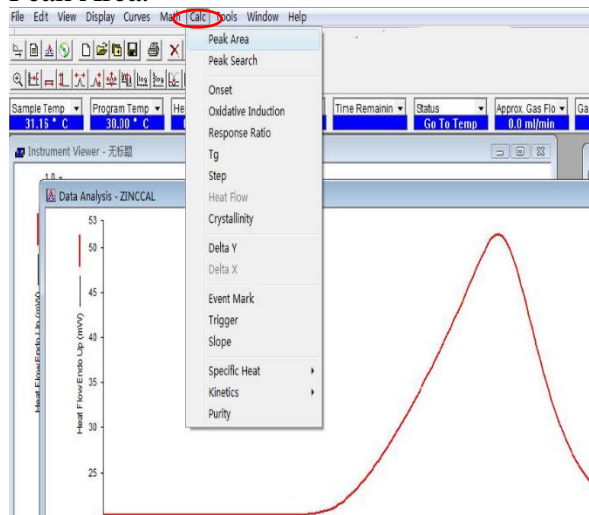
5.2 Click the 'DSC' icon (red circle above) to run the program.

6. Data Process

6.1 Click **Calc** (red circle below) on the bar and select **Peak Area**. Fill the **Left Limit** and **Right Limit** to narrow down the temperature range.

6.2 On the **Peak Calculation** window, check the **Onset** check box (red circle below).

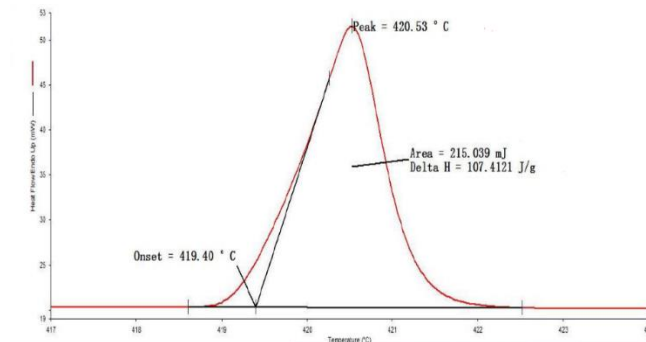
Then click **Calculate** button to get results of Melting Point, Enthalpy, Maximum Absorption Peak and Peak Area.



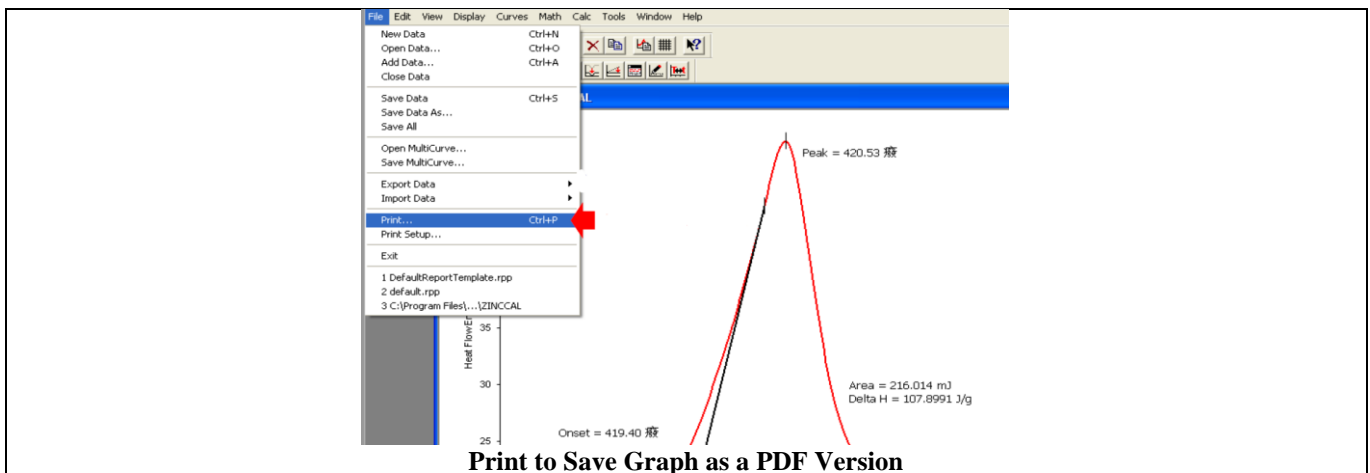
Data Processing

6.3 Click **Edit**→**Copy Image**. Paste the graph to the MS-Word.

Or **File**→**Print** (see below) to save the graph as a PDF version.

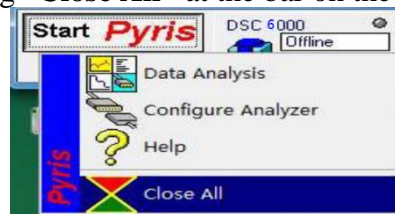


DSC Result Graph



7. Turn Off

- 7.1 Use tweezers to take out all the samples from the instrument.
- 7.2 Turn off the software by clicking “Close All” at the bar on the top of the screen.



Software Turning Off

- 7.3 Turn off the computer.
- 7.4 Turn off the nitrogen gas cylinder and the main switch of the instrument respectively.