setline

simple. powerful

by SETARAM

DSC / DSC+

Setline® by Setaram

Setaram has inspired material scientists for over 70 years with a range of high quality material characterization instruments for even the most challenging experimental conditions.
Now Setline® brings Setaram's thermal analysis expertise to academia with a range of instruments designed to meet the most important educational needs and applications ranging from the acquisition of thermal analysis skills through to basic research.

dsc

SIMPLE

Setline® is easy to use and easy to own.

EASY TO USE

- Setline® is easy to use across diverse academic fields.
- Setline's® compact design is robust and space efficient for all laboratories.
- Options focussed around core needs ensures ease of use and quicker mast
- Setline's® robot (DSC+) automates sample handling across multiple experiments.

EASY TO OWN

- Setline® is built for durability in high use situations.
- Cost of ownership is lowered through simplified maintenance and a Replacement Parts Guarantee*.
- Setline's® Technical and Application support ensures fast, expert help on any question.

*See local guidelines for details

Thermal Analysis and Academia

Thermal analysis has applications in many academic fields including but not limited to Material Science, Metallurgy, Polymer and Physical Chemistry, Chemical Energy, Enginee ring, Geoscience, Pharmacy and Food Science. This diversity highlights the variety of institutes and students who use thermal analysis instruments and often on a continual basis.

With educational needs in mind, Setline® thermal analysis instruments are designed for **simplicity** and **power** .

"Calisto software is intuitive and user friendly, and the more complex features can be learned fast.

The capability to import and treat data from other manufacture analysis instrument or custom-built equipment makes the software extremely valuable for research labs."

Dr Kristina Lilova
PhD in Materials Science /Solid State Chemistry
UC Davis, USA

Setline® by Setaram DSC and DSC+

POWERFUL

Calisto is designed to treat any Thermal Analysis data from any instrument or brand, works on any Setaram instrument and consists of two independent parts:

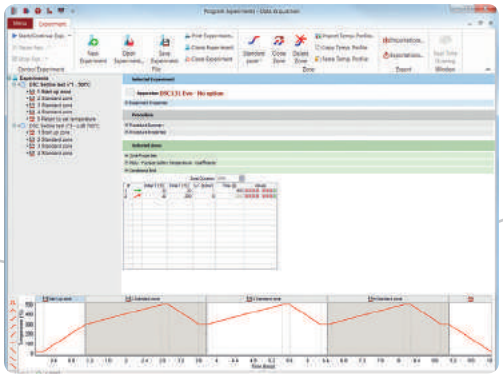
- **CALISTO ACQUISITION** is dedicated to the control and data acquisition of **SETLINE® DSC.** It includes the intuitive set-up of experiment procedures for all conditions and parameters.

- **CALISTO PROCESSING** is designed for **SETLINE® DSC** data treatment and includes:
  - Powerful peak processing (integration, baseline choice, temperature, deconvolution/peak separation etc)
  - Clear step-by-step Heat Capacity (Cp) calculation procedure
  - Options to present data with the maximum impact
  - Direct export to graphical or spreadsheet formats

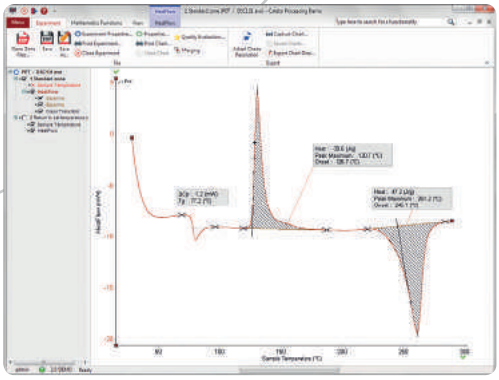
See calisto-software.com for more information on the power of Calisto 2.0 software.

Calisto 2.0 Exclusive Software

With quick to install Calisto software Setline's® DSC and DSC+ are not only **Simple**, they are **Powerful** too.



CALISTO DATA ACQUISITION



CALISTO DATA PROCESSING

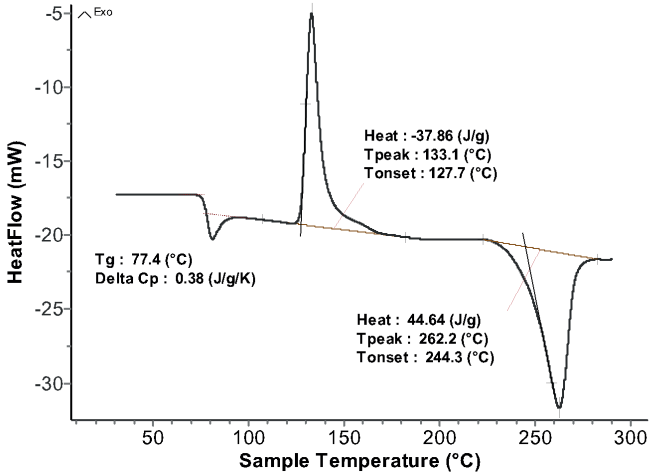
Applications

The combination of **simplicity** and **power** of SETLINE® DSC and DSC$^+$ make them the ideal instruments for a first experience in thermal analysis. With Education in mind, they were designed for the most common applications in industry and research, so offer the best preparation for students' future activities.

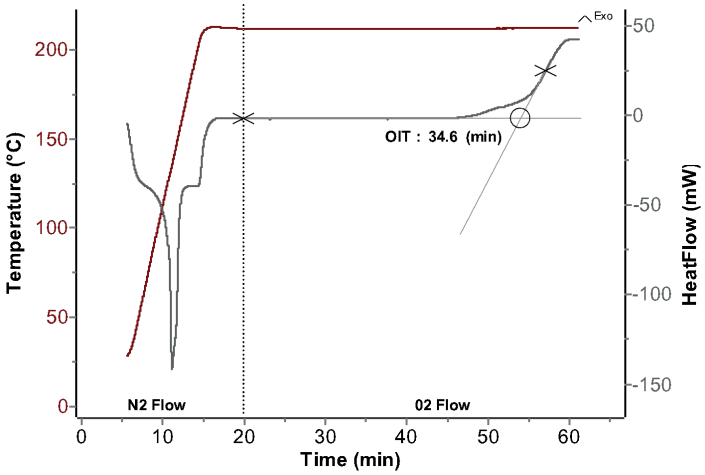
With SETLINE® DSC and DSC$^+$ the main available measurements include:

- Temperatures and enthalpies of melting and crystallization of most materials
- Glass transition temperatures of polymers
- Heat of curing / degree of curing of polymers
- Materials phase diagrams
- Heat capacities of solids or liquids
- Oxygen Induction Time of polymers
- Purity of chemicals using the Van't Hoff method
- Material decomposition and thermal stability

Just two of many common data representations using Calisto 2.0 software:



DSC trace of a 25 mg sample of PET (Poly Ethylene Terephthalate) sample heated at 10 °C/min. From left to right: glass transition, exothermic crystallization of the amorphous phase and endothermic melting. These are key data for the understanding of the thermal behavior of this polymer.

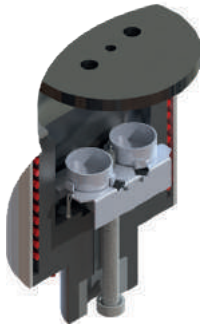


Oxygen Induction Time (OIT) at 210 °C of a synthetic rubber. The sample is heated up to 210 °C under inert gas flow (nitrogen). After signal equilibration (20 minutes), the gas flow is changed to oxygen. An exothermic effect of oxidation of the polymer is observed at approximately 45 minutes. The OIT, defined as the time between the switch to oxygen and the onset time of the effect, is found equal to 34.6 min. It could be increased by the addition of antioxidants.

For more information, a free DSC Basics and Practical Exercise workbook and an extensive application library please refer to:

www.setaramsolutions.com

Features



SETLINE® TRANSDUCER

SENSOR

The Setline® transducer is made from chromel-constantan and uses plate-shaped DSC rod technology ensuring high sensitivity over the full temperature range (-170 °C to 700 °C). It is housed in a small volume, resistor furnace with low thermal inertia. This enables high heating and cooling rates for the multiple, high speed experiments typical in academic environments.

The furnace temperature is extremely uniform, ensuring high quality data and accurate sample temperature measurement of thermal events.

CRUCIBLES

We provide Regular and High Pressure crucibles.
• Regular Alumina and Aluminium (30 and 100 µl) crucibles ensure good thermal transfer between sample and sensor.
• For Setline DSC and DSC+ : Stainless Steel (30 µl) crucibles and Gold plated (30 µl) crucibles up to 200 bar and 400 °C provide High Pressure capability while being inert to most sample types.
• For Setline DSC : High Pressure Incoloy (30 µl) crucibles deliver unmatched high pressure capability up to 500 bar, 600 °C.

SUB-AMBIENT COOLING OF THE SETLINE® DSC AND DSC+

There are three types of sub-ambient cooling devices:

- **Liquid Nitrogen (LN2) Manual cooling accessory for DSC operating from -170 to 400 °C**
- **Liquid Nitrogen (LN2) Automated cooling accessory for DSC and DSC + operating from -150 to 400 °C****
- **A cryothermostat cooling device for intermediate temperature ranges for DSC and DSC+****
  -60°C* to 200°C under a flow of Helium
  -50°C to 400°C under a flow of Argon, Nitrogen or dry Air

Specifications

	SETLINE® DSC	SETLINE® DSC+
Temperature range (°C)	-170 to 700	-170** to 700
Programmable heating rate (°C/min)	0.01 to 100	0.01 to 100
Cooling time	12 min from 500 °C to 100 °C (air) 12 min from 25 °C to -100 °C (LN_2) 5 min from 100 °C to 0 °C (cryothermostat)	12 min from 500 °C to 100 °C (air) 12 min from 25 °C to -100 °C (LN_2) 5 min from 100 °C to 0 °C (cryothermostat)
Enthalpy accuracy / precision* (%)**	+/- 0.8 / 2.5	
Temperature accuracy / precision* (°C)**	+/- 0.30/ 0.50	
DSC measurement range (mW)	+/- 6 000	
Atmosphere	Inert gas, air (possible gas switch between 2 gases)	
Gas flow range (ml/min)	10 to 100	
Autosampler	-	59 positions (samples or references)
Height - Width - Depth (mm) / (in)	320 - 380 - 500 / 12.6 - 15 - 19.7	365 (825 open) - 455 - 510 / 14.4 (32.5 open) -17.9 - 20
Power requirements	230V - 50/60Hz	230V - 50/60Hz

***Lower temperatures can be achieved. The time to reach these minimum temperatures can be over two hours; **When sub-ambient cooling devices are used, the autosampler cannot operate; ***Based on indium melting tests**

Setline® by Setaram. Unusually Simple. Surprisingly Powerful.

setline by SETARAM
simple. powerful

Switzerland – France – China – United States – India – Hong Kong

For contact details: **www.setaramsolutions.com or setaram@kep-technologies.com**

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