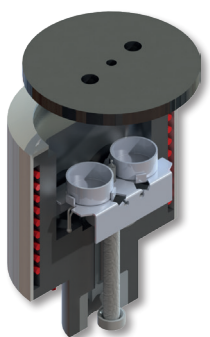


Features



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.

Furnace temperature is extremely uniform, ensuring high quality data and accurate sample temperature measurement of thermal events and during transitions.



CRUCIBLES

We provide Regular and High Pressure crucibles. Regular crucibles - Alumina, Aluminium (30 and 100 µl) ensure good thermal transfer between sample and sensor. High pressure crucibles – Incoy (30 µl) deliver unmatched high pressure capability (up to 500 bar / 7 250 psi, 600 °C) whilst the DSC sensor remains at atmospheric pressure.

SUBAMBIANT COOLING OF THE SETLINE® DSC AND DSC<sup>+</sup>

There are three types of subambient cooling devices:

- **Liquid Nitrogen (LN<sub>2</sub>) Manual cooling accessory for DSC and DSC<sup>+</sup> operating from -170 to 400 °C**
- **Liquid Nitrogen (LN<sub>2</sub>) Automated cooling accessory for DSC and DSC<sup>+</sup> operating from -170 to 400 °C**
- **A cryothermostat cooling device for intermediate temperature ranges for DSC:**
  - -70 °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 <sup>+</sup>
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 <sub>2</sub> ) 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 <sub>2</sub> )
Enthalpy accuracy / precision** (%)	+/- 0.8 / 2.5	
Temperature accuracy / precision** (°C)	+/- 0.07 / 0.15	
DSC measurement range (mW)	+/- 600 (small range) ; +/- 6 000 (large range)	
Atmosphere	Inert gas, air (possible gas switch between 2 gases)	
Gas flow range (ml/min)	10 to 100	
Autosampler	-	66 positions (samples or references)
Height - Width - Depth (mm) / (in)	317 - 376 - 430 / 12.5 - 14.8 - 16.9	362 to 815 (open cover) - 455 - 508 / 14.3 to 32.1 (open cover) - 17.9 - 20
Power requirements	230V - 50/60Hz	230V - 50/60Hz

\*Sub-ambient available without autosampler function only / \*\*Based on Indium melting tests



SETARAM Instrumentation  
Switzerland – France – China – United States – India – Hong Kong  
For contact details: [www.setaram.com](http://www.setaram.com) or [sales@setaram.com](mailto:sales@setaram.com)



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DSC / DSC<sup>+</sup>



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## Setline® by Setaram

**Setaram** has inspired material scientists for over 60 years with a range of high quality material characterisation 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 mastery.
- Setline's® robot (DSC<sup>+</sup>) automates sample handling across multiple experiments.

#### EASY TO OWN

- Setline® is built for durability in continual usage environments.
- 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.

## 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, Engineering, 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 manufactures' thermal 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<sup>+</sup>

## 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

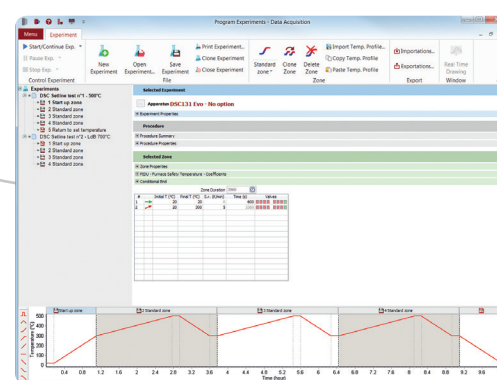
See [calisto-software.com](http://calisto-software.com) for more information on the power of Calisto 2.0 software.



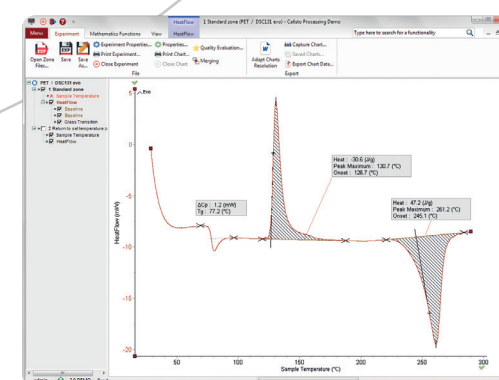
dsc+

## Calisto 2.0 Exclusive Software

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



CALISTO DATA ACQUISITION



CALISTO DATA PROCESSING

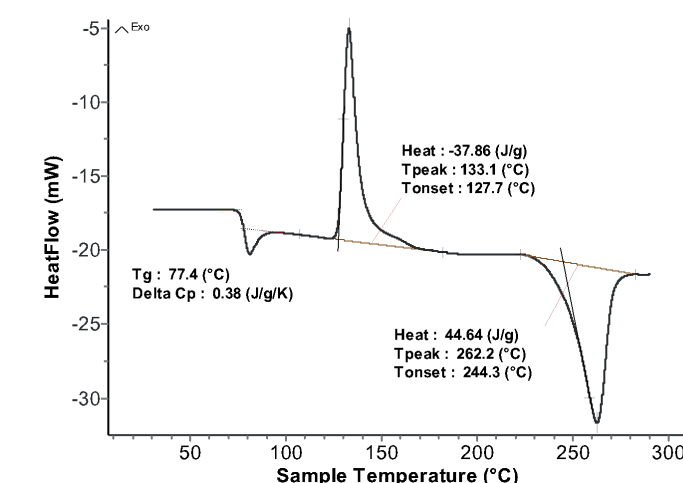
## Applications

The combination of **simplicity** and **power** of SETLINE® DSC and DSC<sup>+</sup> 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.

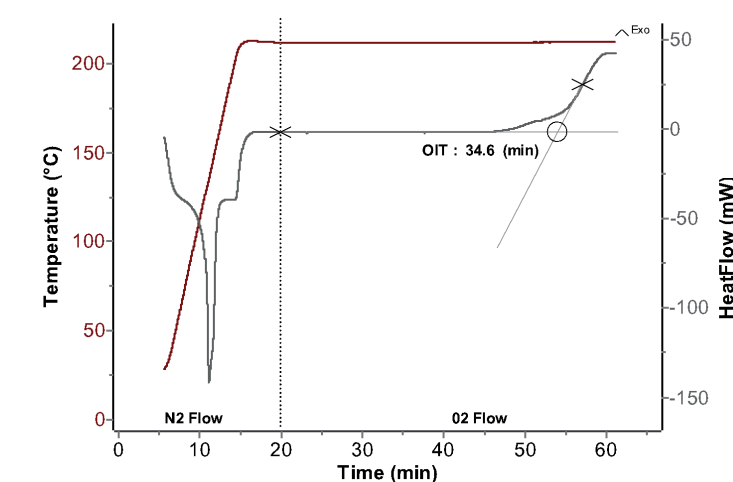
### With SETLINE® DSC and DSC<sup>+</sup> the main available measurements include:

- 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
- Materials 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.



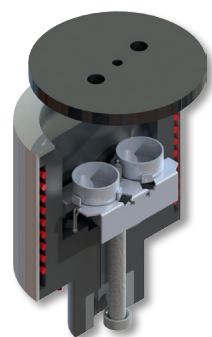
Oxygen Induction Time (OIT) at 210 °C of a synthetic rubber. The sample is heated up to 210 °C under inert gas flow (nitrogen). After signal equilibration (20 minutes), the gas flow is changed to oxygen. An exothermic effect of oxidation of the polymer is observed at approximately 45 minutes. The OIT, 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 and a free DSC Basics and Practical Exercise workbook visit: [setline.setaram.com](http://setline.setaram.com)

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setline  
simple. powerful



DSC / DSC<sup>+</sup>



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SETARAM Instrumentation  
Switzerland – France – China – United States – India – Hong Kong  
For contact details: [www.setaram.com](http://www.setaram.com) or [sales@setaram.com](mailto:sales@setaram.com)



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## Setline® by Setaram

**Setaram** has inspired material scientists for over 60 years with a range of high quality material characterisation instruments for even the most challenging experimental conditions. Now Setline® brings Setaram's thermal analysis expertise to quality control with a range of instruments designed to meet the most important QC needs and applications.

dsc



## SIMPLE

### Setline® is easy to use and easy to own.

#### EASY TO USE

- Setline® DSC / DSC<sup>+</sup> is easy to use across diverse QC fields.
- Setline's® robust DSC sensor technology ensures quality, consistent and reliable data.
- Setline's® compact design is robust and space efficient for all laboratories.
- Setline's® DSC<sup>+</sup> automates repetitive testing saving significant time.
- High uptime due to 66 position auto-sampler, fast heat up and cool down.

#### EASY TO OWN

- Setline® is built for durability in intensive usage situations.
- Cost of ownership is lowered through simplified maintenance for minimized down time and a Replacement Parts Guarantee.
- Setline's® Technical and Application support ensures fast, expert help on any question.
- Calisto 2.0 exclusive software ensures intuitive and easy handling.

## Thermal Analysis and Quality Control

Manufacturers need to meet the increasing demand for product quality and performance.

Product materials and manufacturing processes can both be monitored using thermal analysis to ensure optimal product quality and productivity. It's application within quality control is therefore both broad and numerous and includes polymer, pharmaceutical, cement, steel, battery, textile, carbon and catalyst manufacture to name a few.

With diverse industries and their commercial needs in mind, Setline's® thermal analysis instruments are designed for **simplicity** and **power**.



"During my PhD studies I had to use three different programs to collect and analyze the calorimetric data, and to show graphically the results. Calisto combines all the steps from accurate peak integration to heat capacity determination to even analyze data from other types of equipment."

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

# Setline® by Setaram DSC and DSC<sup>+</sup>

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• **CALISTO PROCESSING** is designed for **SETLINE® DSC** data treatment and includes:

- Powerful peak processing (integration, baseline choice, temperature, deconvolution/peak separation etc)
- Data integrity features with user rights management options, data modification traceability, secured access etc
- Automated data processing adapted to your needs with user-recorded macros
- Options to present data with the maximum impact
- Direct export to graphical or spreadsheet formats

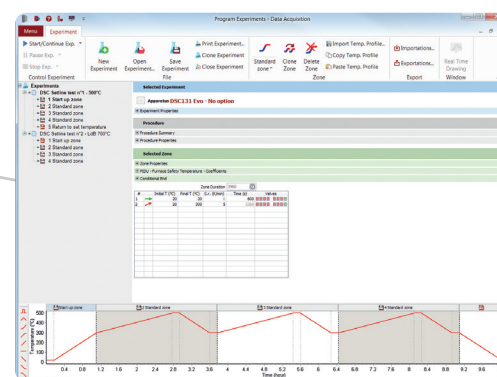
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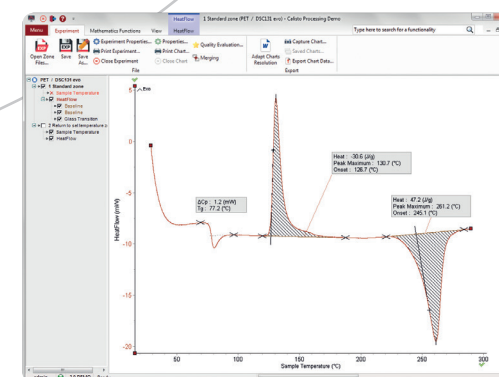
dsc+

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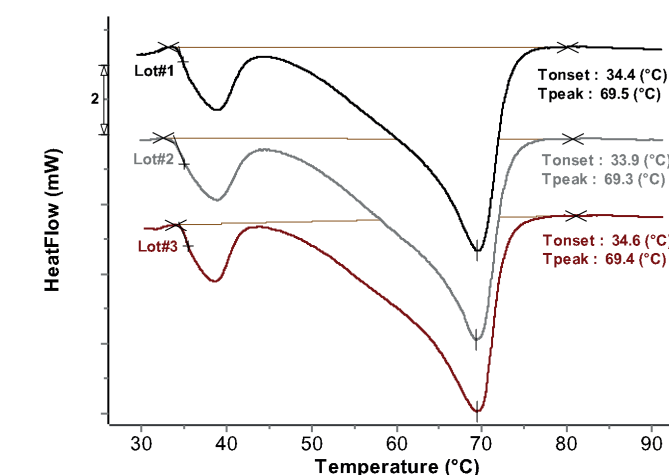
## Applications

The combination of **simplicity** and **power** of SETLINE® DSC and DSC<sup>+</sup> make them the ideal instruments for intensive use in material quality and control testing. Most QC laboratories manage multiple material characterization methods incompatible with complex, user intensive technology and instrument downtime. The robustness and high testing throughput of the DSC<sup>+</sup> auto-sampler combined with Calisto's fast and simple data treatment powered by user-recorded macros are ideal for QC labs.

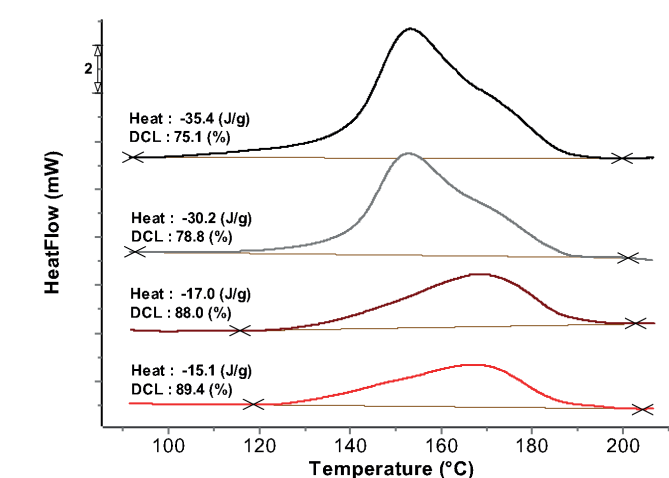
**Setline® instruments are designed for the most common DSC measurements in industry including:**

- Temperatures and enthalpies of melting and crystallization
- Glass transition temperatures of polymers
- Heat of curing / degree of curing of polymers
- Oxygen Induction Time of polymers
- Purity of chemicals using the Van't Hoff method
- Materials decomposition and thermal stability

**Just two of many common data representations using Calisto 2.0 software can be seen below:**



Melting profiles of 3 different lots of the same cosmetic ingredient (lipstick). Determination of the start (onset) and end (peak) temperatures of melting.



Determination of the degree of crosslinking (DCL) of ethylene-vinyl acetate (EVA) copolymers films after lamination. EVA films are meant to be used as encapsulants for photovoltaic applications. The heat of the residual curing reaction is measured and divided by the heat of reaction of an uncured sample to calculate DCL. The several lots tested show various DCL.

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