DSC450

DSC Analysis and Imaging System

Thermal Analysis
Measure glass transitions, oxidation, crystallisation and melting peaks

Wide Temperature Range
Accurate control from –150°C up to 450°C for a range of applications

Real-time Imaging
Better understand your sample by correlating visual changes with heat flow data

LINKAM

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Introducing the Optical DSC450

The DSC450 system has been optimised for those wishing to measure transition temperatures and enthalpy changes of their samples in combination with optical microscopy. Differential Scanning Calorimetry (DSC) is a technique used to measure the temperature and heat flow associated with thermal transitions in materials. The design of the DSC450 allows mounting of the stage on a microscope, enabling image and time lapse recording of sample transitions at high resolution.

The DSC450 enables the user to measure and image thermal phase transitions, such as melting points and glass transitions, of a wide range of substances whilst accurately controlling temperature from -150°C to 450°C. The atmosphere of the stage can also be purged with gas as required by the user. Two systems are available:

- **Optical DSC450 System** which comprises a DSC450 stage, T96-S controller and LINK software.
- **Optical DSC450 Pro Imaging System** which includes a DSC450 stage, T96-S controller, LINK software, Imaging Station, high performance colour camera and an RLS20 reflected light source.

Optional LINK modules include Thermal Analysis by Structural Characterisation (TASC). For cooling below ambient temperatures, an optional LNP96-S liquid nitrogen pump is also available.

Features

DSC Analysis
The DSC450 is ideal for measuring and imaging glass transitions and melting peaks for a range of applications including materials, pharmaceuticals and food. A sealed crucible is also available for closed-pan experiments.

Highly Sensitive
Study thermal transitions at low heating rates, or with small sample sizes, with no loss of sensitivity.

Wide Temperature Range
The temperature range spans from -150°C (with the addition of an optional LNP96-S) to 450°C.

Optical Capabilities
Optimised for the Linkam Imaging Station allowing simultaneous imaging and DSC analysis.
The chamber lid is fitted with a fused silica window for high quality image capture and recording.

Thermal Analysis by Structural Characterisation (TASC)
TASC, developed in conjunction with Cyversa, is an optional module that tracks changes in surface structure and is highly sensitive to glass and melt transitions. In addition to the DSC signal, TASC makes it possible to analyse different parts of the same sample to identify inhomogeneities. TASC can be combined with any Linkam thermal stage, creating a modular thermal analysis system.

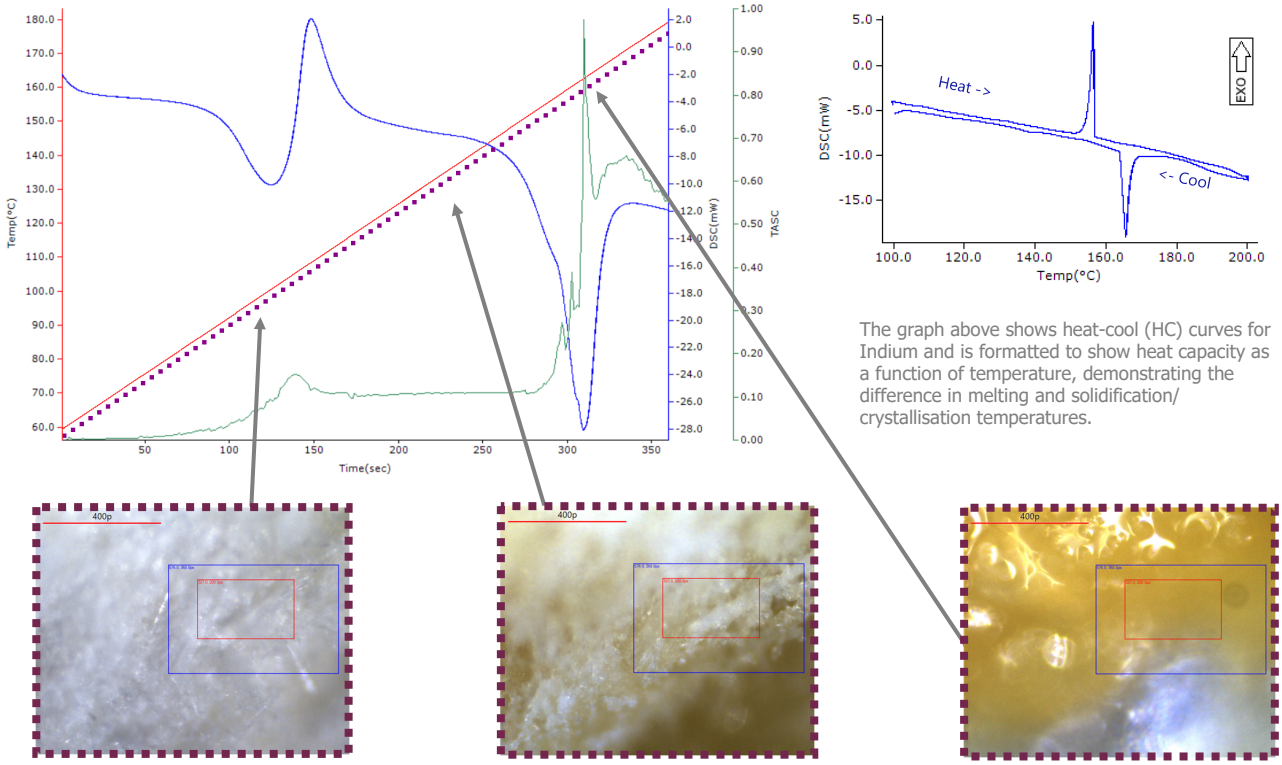
Custom Options
Please contact us with details of your requirements.

Application Examples

The DSC450 is a thermoanalytical tool which is used to measure melting peaks and glass transitions in addition to illustrating optical and physical changes in your sample. The system can be used in a variety of different fields, including polymer and plastic characterisation, pharmacology and medical compound analysis, geological studies and many more.

The graph below on the left-hand side shows a typical output from LINK software for a DSC450 experiment performed on an Indium sample. The blue line represents the heat flow, the straight red line shows the constant increase in temperature. The purple markers show the timepoint of the images captured, examples of which are displayed below the graphs.

TASC structural analysis can be performed on any video captured with LINK (optional TASC module), and is shown as a green curve. The transitions are mirrored in the heat capacity and structural analysis. DSC and TASC data can be used separately or in unison to characterise thermomechanical changes in a wide range of samples.

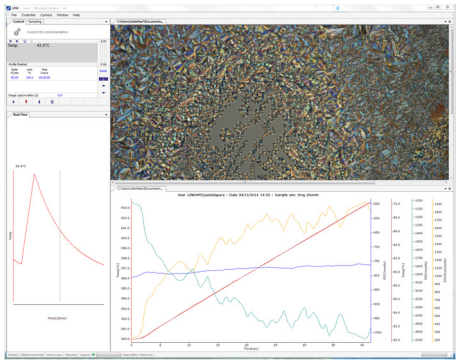


The graph above shows heat-cool (HC) curves for Indium and is formatted to show heat capacity as a function of temperature, demonstrating the difference in melting and solidification/ crystallisation temperatures.

Technical Specification

Temperature Range	-150°C (with the addition of an optional LNP96-S) to 450°C
Heating/Cooling Rates	0.01°C to 30°C/min
Temperature Stability	< 0.1°C
Objective Lens Working Distance	9.7mm
Sample Pan Options	Aluminium, Sapphire
Furnace Lid Options	Sapphire, Silver
mW Accuracy	0.01mW

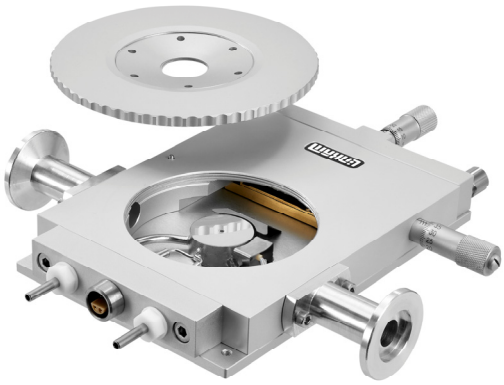
Discover More...



LINK Control Software

Take control of your experiment with the LINK software. In addition to temperature, LINK can control or monitor many other device parameters such as vacuum, humidity, tensile force and shear force (dependent on system). LINK can be programmed with up to 100 ramps and provides real-time graphical feedback.

Optional modules to further enhance your system include LINK Imaging for synchronised image capture, LINK Extended Measurements for recording the measurement of key features in your images, LINK 21CFR11 for data regulatory compliance and LINK TASC providing image analysis based thermal analysis.

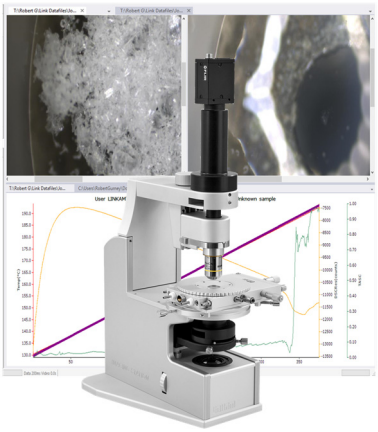


FDCS196

Developing freeze-drying protocols is a time consuming and expensive process which can be wasteful. The FDCS196 has been designed to provide a platform to quickly and accurately characterise your freeze-drying protocol by precisely controlling sample temperature and stage vacuum pressure. The system provides a complete solution to meet your lyophilisation research requirements.

Ultra-low temperature eutectics can be investigated with the FDCS196 system. Chamber pressure is monitored by a Pirani vacuum gauge mounted directly on the device. The XY manipulators can be used to follow the drying front moving across the sample.

Pressure can be automatically controlled by Linkam's MV196 motorised valve. Using LINK software, a chart of temperature against time shows a real-time plot of the chamber pressure throughout the experiment.



Thermal Analysis by Structural Characterisation (TASC)

TASC is an image analysis technique that can be used to analyse highly localised changes in sample features that occur during heating or cooling, for example phase changes such as melting or glass transitions.

TASC, developed in collaboration with Cyversa, is a ground-breaking analysis technique due to its ability to measure many different microscopic locations across the sample making it ideal for studying sample inhomogeneity.

TASC and DSC can be seen as complimentary techniques. TASC is an optional module of LINK software (requires LINK Imaging Module).

Contact Details

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We make scientific instruments that help characterise materials from polymers to biological tissue and metals to composites. Our instruments are used for research by the world's most advanced scientific organisations and companies. Each of our instruments are designed and manufactured in-house by our team of highly experienced electronics, software and mechanical design engineers. We design and develop solutions for sample characterisation by collaborating with the best scientists in the world. Will you be next?

Linkam products are constantly being improved, hence specifications are subject to change without notice.
TASC products are a family of techniques developed by Prof. Mike Reading (Cyversa) and Linkam.

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