DSC600 and DSCX600

Systems for a Visual Approach to Thermal Analysis

DSC600

Heating and Cooling
Temperature range from < -195°C up to 600°C

Analysis with Spectroscopy
Combine with analytical techniques such as FT-IR, Raman, confocal and XRD

Variable Heating Rates
Precise control from 0.01°C to 130°C/min

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Introducing the DSC600 and DSCX600

Differential Scanning Calorimetry (DSC) is used to measure the temperature and heat flow associated with thermal transitions in materials. Linkam's DSC600 and DSCX600 are novel, single cell systems optimised for simultaneous imaging and heat flow measurements. Their unique design allows the cell to be used on a variety of systems, including FT-IR and Raman spectrometers.

These systems are unique in that they accommodate both the needs of thermal analysts by allowing them to observe sample calorimetry as it is heated or cooled, alongside the needs of microscopists who wish to measure the transition temperatures of samples they observe under the microscope and monitor physical changes in the sample such as morphology and colour.

It is also possible to work in transmitted light mode, including polarised light microscopy, using transparent sapphire pans. At the heart of both systems is a silver heating block and temperature sensor where the sample pan is placed. The pan may be open for reflected light work or sealed for optimum calorimetric accuracy.

The DSCX600 has been specifically optimised for use with X-ray systems including WAX/SAX and synchrotron systems. The low mass single furnace ensures rapid heating and cooling rates (up to 130°C/min), a fast response time so that manufacturing processes may be replicated, and high laboratory productivity with fast cool down time. The DSC600 and DSCX600 are both compatible with the optional LNP96-S liquid nitrogen pump for sub-ambient operation.

A system requires the DSC600 or DSCX600 and a T96-S temperature controller with NEXUS software for computer control. For cooling below ambient temperatures an optional LNP96-S liquid nitrogen pump is also available.

Features

DSC Analysis
The DSC600 system is ideal for measuring glass transitions and melting peaks for a range of applications including materials, pharmaceuticals and food. A sealed aluminium crucible is also available for closed-pan experiments.

Wide Temperature Range
< -195°C (with the addition of an optional LNP96-S) up to 600°C.

High Productivity
Small single furnace and optimised liquid nitrogen cooling for fast sample throughput.

Imaging and Spectroscopy Capabilities
The system has been optimised for simultaneous imaging and DSC analysis with a wide range of microscopy and spectroscopy techniques. Sapphire crucibles are available for transmitted light work.

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 to create a modular thermal analysis system.

Custom Options
Please contact us with details of your requirements.

Application Examples

The versatile DSC600 series can be configured to pair thermal analysis with a wide range of microscopy or spectroscopy techniques, suitable for a broad range of applications:

Plastics and Polymers

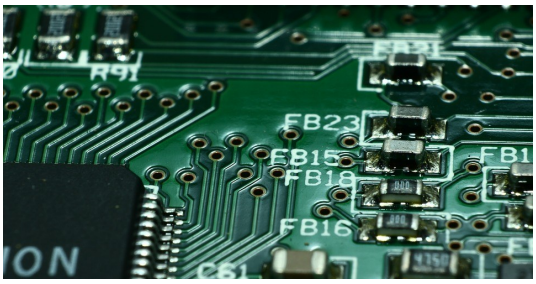
The DSC600 stages have many applications from early in the research and development cycle to manufacturing and quality control. They are particularly useful for observing phase transitions and molecular changes simultaneously with microscopy or spectroscopy.

Melting Point Analysis | Nucleation Rate | Crystallisation

Semiconductor and Electrical

Thermal characterisation is commonly used for the analysis of semiconducting materials. The DSC600 stages can be used alongside electro-analytical techniques used in many research fields, from electrical devices to energy storage and renewable energy materials.

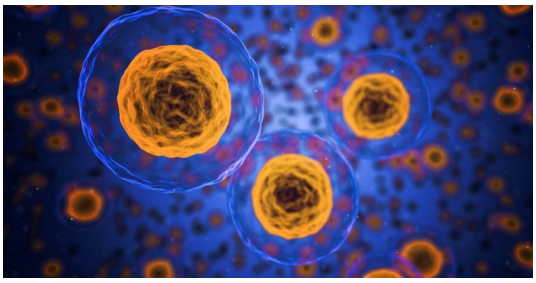
Photovoltaics | Liquid Crystals | Molecular Structure



Life Sciences

Use the DSC600 stages to combine calorimetry with analysis of biological and medical specimens through microscopy, spectroscopy or XRD, from analysis of biomaterials and composites to cell morphology and water-ice vitrification and cell preservation.

Pharmaceuticals | Vitrification | Medical Applications



Technical Specification

Temperature Range	< -195°C (with the addition of an optional LNP96-S) to 600°C
Heating/Cooling Rates	0.01°C to 130°C/min
Temperature Stability	< 0.1°C
Objective / Condenser Lens Working Distance	7.1mm (minimum) / 12.6mm (minimum)
Sample Pan Options	Aluminium (for DSC, reflected light and X-ray studies) Sapphire (for DSC and transmitted light studies, including polarised light microscopy)
Aperture Options	Standard Lid 1.3mm Ø, custom options available
Compatibility	Linkam Imaging Station, FT-IR, Raman, confocal and others. Clamping options are additionally available for most microscopes.

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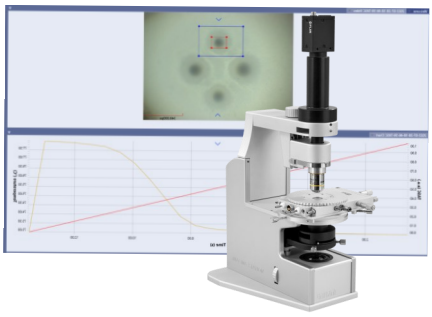
Discover More...



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 NEXUS software and requires the NEXUS Image Capture Module.

Optical DSC450

The DSC450 provides a route to sample calorimetry measurements with a dual-pan differential scanning system, enabling optical sample analysis via reflected light through the transparent quartz DSC pan lid.

The design allows mounting of the device on a microscope, enabling image and time lapse recording of sample transitions at high resolution. A sealed crucible is also available for those wishing to conduct closed-lid experiments.

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.

MFS — Modular Force Stage

The MFS provides an ideal platform for analysing the tensile properties of materials in relation to temperature and other environmental conditions, including humidity control (when combined with our RH95), or in situ submerged measurements with our liquid cell.

A number of modular options are available, facilitating temperature control from <-195°C up to 350°C, force ranges from 0 up to 600N, humidity control, and grips enabling a wide variety of sample types to be tested.

The MFS can be used for precise mechanical and optical characterisation including modulus analysis, single fibre strength tests, failure mode and fracture analysis, peel adhesion tests, compression and three-point bend testing, and many more with our custom-designed grips.

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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