

DSC600 VISTA

A visual approach
to thermal analysis



Measure

Heat Flow
Reflected Light Intensity

Imaging

Reflected or Transmitted Light

Linkam

Scientific Instruments

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Introduction

The new Linkam DSC600 VISTA is a novel single cell DSC system that is optimised for simultaneous imaging and heat flow measurements. The unique design allows the cell to be used on a variety of microscope systems, including FTIR and Raman spectrometers, as well as synchrotron x-ray systems.

The low mass single furnace ensures fast heating and cooling rates (up to 100°C/min) and a fast response time so that manufacturing processes may be replicated as well as ensuring high laboratory productivity with fast cool down time.

The DSC600 VISTA is compatible with the LNP95 cooling system for sub ambient operation and the ECP water circulator for ensuring the stage body is kept at a constant temperature when operating at temperatures above 300°C for prolonged periods.

Overview

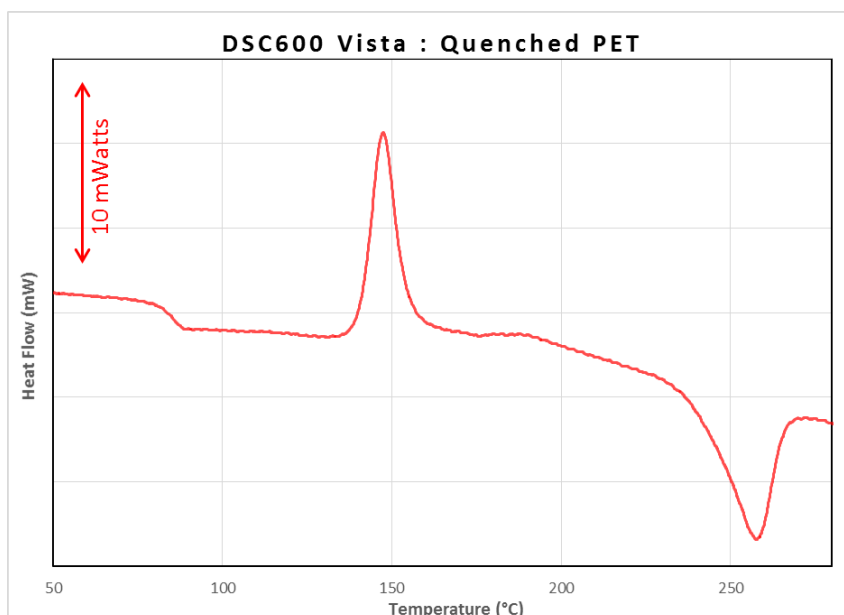
The DSC600 VISTA has been designed for the thermal analyst who wishes to observe the sample as it is heated or cooled. Likewise the DSC600 VISTA has been designed for the microscopist who wishes to measure the transition temperatures and enthalpy changes of the sample they observe under the microscope.

These needs are often conflicting. The thermal analyst typically works in a sealed (aluminium pan / furnace) environment where it is not possible to observe the sample. The microscopist desires a thin sample that can be observed with transmitted light. The DSC600 VISTA resolves these conflicting requirements by allowing the sample to be imaged in an open pan in an environment that is sealed with a sapphire window. It is also possible to work with sapphire pans in a transmitted light mode, if required.

At the heart of the DSC600 VISTA is a silver heating block and temperature sensor onto which the sample pan is placed. The pan may be open for reflected light work or sealed for optimum calorimetric accuracy, pans and lids are available in both aluminium and sapphire.

The furnace and sensor are located in a water cooled aluminium block that also contains purge gas and liquid nitrogen cooling port connectors. The entire stage may be fixed to a number of popular microscope systems as well as the Linkam Scientific Imaging Station to create a VISTA system.

The DSC600 VISTA is a member of the Linkam VISTA family and is optimised for use on the Linkam Imaging Station using Linksys software.



System Highlights

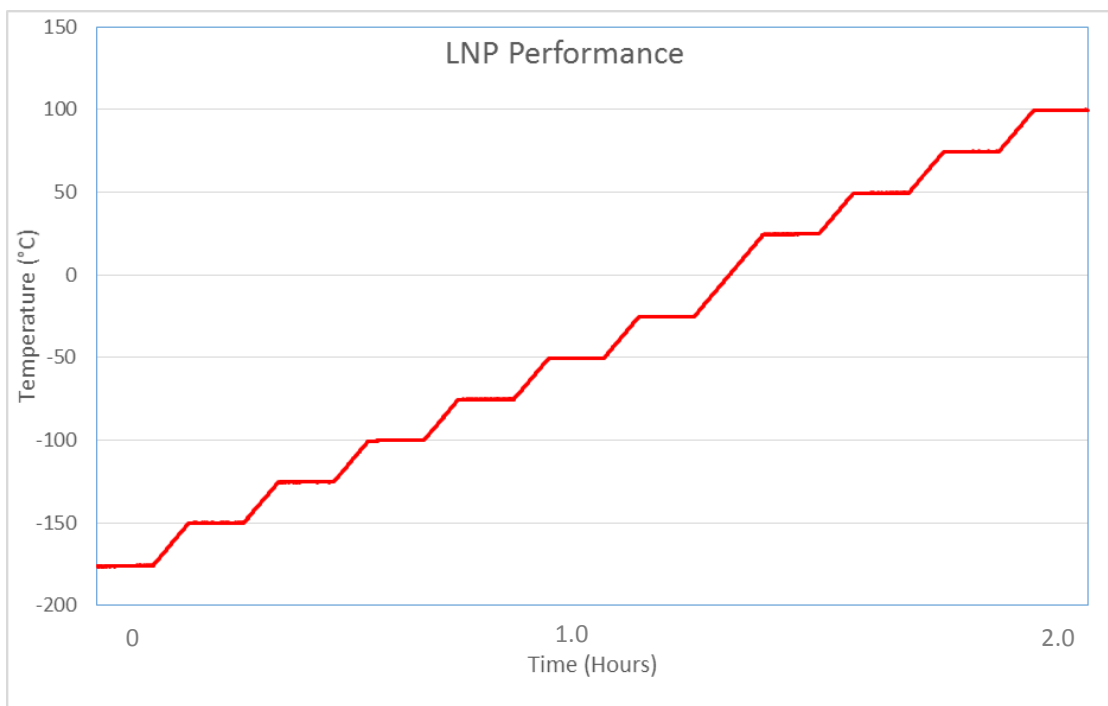
High Productivity	small single furnace and optimised water and liquid nitrogen cooling for fast sample throughput
Compatible	use on the Linkam Imaging Station, conventional optical microscopes, FTIR, Raman and Confocal microscopes
Flexible	multiple operating modes optimised for DSC, optical or simultaneous measurements. Reflected and transmitted light studies
Cost Effective	low initial capital outlay and low running costs for sub ambient operation
High Sensitivity	Study thermal transitions at low heating rates, or with small sample size, with no loss of sensitivity
Versatile	simultaneously measure heat-flow and record images of the sample from -196 to 600°C
Expandable	add unique TASC software to create thermal curves from acquired images to further expand the analysis capabilities

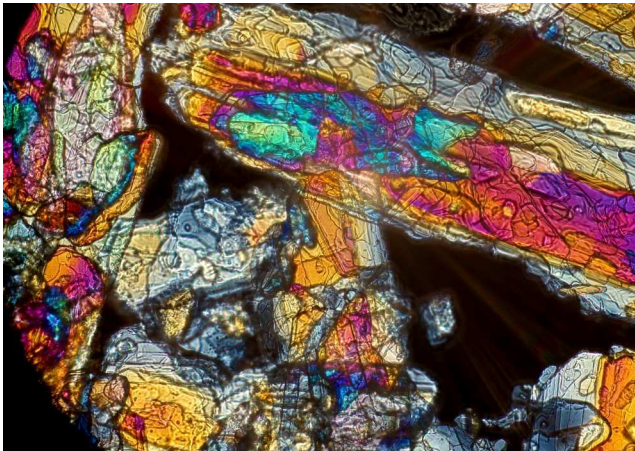
Low Temperature Performance

The DSC600 VISTA has been designed to operate with the LNP system for low temperature operation and is optimised for minimum liquid nitrogen consumption. The system works by pulling liquid nitrogen from a small 2 litre reservoir through the heating block. This ensures rapid cooling and very low liquid nitrogen consumption.

In the example below the DSC600 VISTA was cooled from ambient temperature down to -175°C and after reaching equilibrium, held for 2 minutes. The system was then ramped at 20°C/min to -150°C and held for a further 2 minutes and this heat / hold was repeated at 25°C increments to 100°C.

The entire experiment below only used ~ 1 litre of liquid nitrogen.





Specifications

Temperature Range	Ambient to 600°C -196° to 600°C with optional LNP system
Heating / Cooling Rate	0.1°C to 130 °C/min in 0.1°C increments
Temperature Stability	<0.1°C
Enthalpy Reproducibility	<5%
Calibration	
Temperature	Multiple values
Enthalpy	Single value
Sample Pans	
Aluminium	For DSC, reflected light and x-ray studies
Sapphire	For DSC and transmitted light studies
Objective Lens	Minimum 6.4mm working distance
Condenser Lens	Minimum 12.7mm working distance
Aperture	
Silver Lid	1.3mm diameter
Sapphire Lid	12mm diameter
Optional	Thermal Analysis by Surface Characterisation software (TASC)

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