CALNEOS by LINSEIS

pushing boundaries

DSC L92

Ultimate **Micro Calorimeter**

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Since 1957 LINSEIS Corporation has been delivering outstanding service, know-how and leading innovative products in the field of thermal analysis and thermo-physical properties.

Customer satisfaction, innovation, flexibility, and high quality are what LINSEIS represents. Thanks to these fundamentals, our company enjoys an exceptional reputation among the leading scientific and industrial organizations. LINSEIS has been offering highly innovative benchmark products for many years.

The LINSEIS business unit of thermal analysis is involved in the complete range of thermoanalytical equipment for R&D as well as quality control. We support applications in sectors such as polymers, chemical industry, inorganic building materials, and environmental analytics. In addition, thermophysical properties of solids, liquids, and melts can be analyzed.

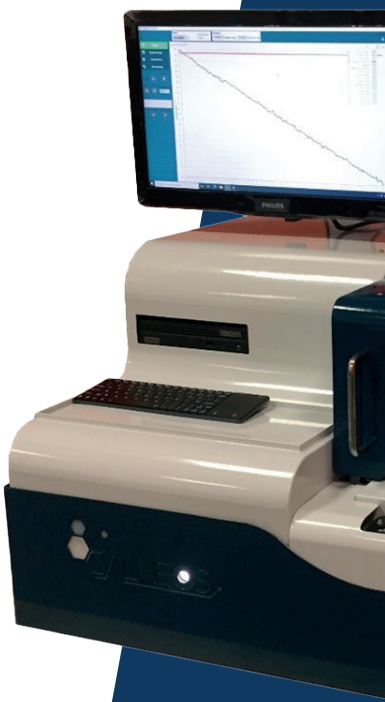
Rooted in a strong family tradition, LINSEIS is proudly steered into its third generation, maintaining its core values and commitment to excellence, which have been passed down through the family leadership. This generational continuity strengthens our dedication to innovation and quality, embodying the essence of a true family-run business.

LINSEIS provides technological leadership. We develop and manufacture thermoanalytic and thermophysical testing equipment to the highest standards and precision. Due to our innovative drive and precision, we are a leading manufacturer of thermal analysis equipment.

The development of thermoanalytical testing machines requires significant research and a high degree of precision. LINSEIS Corp. invests in this research to the benefit of our customers.

C L A U S L I N S E I S

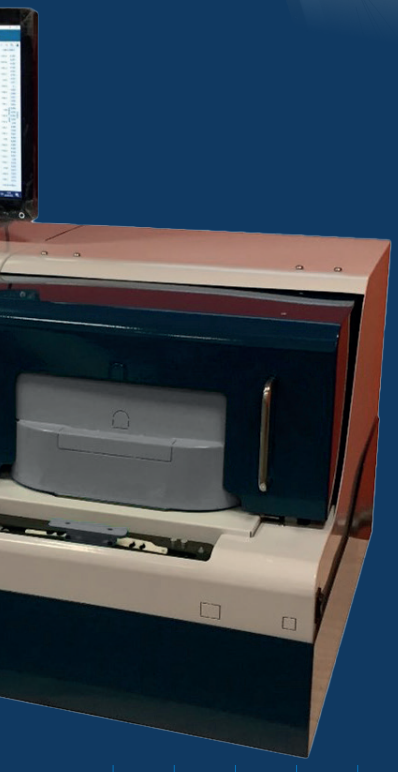
C E O D I P L . P H Y S .



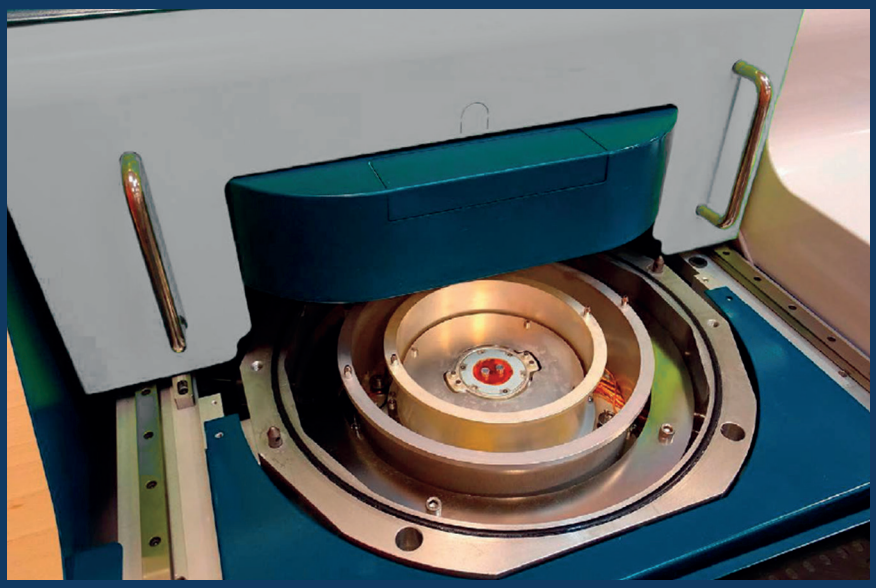
Engineering & Innovation

To strive for the best due diligence and accountability is part of our DNA. Our history is affected by German engineering and strict quality control.

We want to deliver the latest and best technology for our customers. LINSEIS continues to innovate and enhance our existing thermal analyzers. Our goal is to constantly develop new technologies to enable continued discovery in Science.



Ultimate
Micro Calorimeter



- Ultra sensitive
- High performance
- Ultra simple

The Ultimate micro calorimeter UMC is a differential temperature scanning micro calorimeter offering unrivalled sensitivity, enabling the study of all types of materials, including the most dilute solutions. It operates as a conventional micro-calorimeter.

The UMC‘s unique, innovative design enables sensitive measurement at a level never archieved before for a micro-calorimeter with extractable cells/test crucibles.

Available **Cells**

1 Batch cells

These cells can be used to study solids and liquids. They are the best for precise heat capacities measurements (better than 3%) of and they are reusables.
They can also be used to study transitions (melting/crystallisation) and liquid-solid or liquid-liquid phase diagrams.
Useful volume: 700 µl
Closed system (silicone O-ring): mass measurement
Pressure: a few bars

2 Liquid Cp cells high pressure

These cells have been specifically developed to measure the heat capacity of liquids under pressure. Their unique design makes them easy to fill completely and clean. Measurements are carried out in constant volume and the cells are installed in the instrument for the entire measurement campaign. They do not need to be removed to change the liquid being measured, which means that the Cp volume can be measured with an accuracy of better than 1%.
These cells can be used to observe very weak liquid-liquid transitions such as „demixing“ or „degassing“.
They can be used at atmospheric pressure or under a few bars and have been tested
up to 100 bars. With the right equipment, these cells can also be filled under pressure.
They can therefore be used to analyse gas-laden solutions under pressure.
Useful volume: 750 µL
Open system: volume measurement
Pressure: 100 bar

3 BI-Compartment cells

These cells enable enthalpy of reaction measurements to be made by limiting the Cp effect of the injection. A liquid is loaded into the upper compartment and injected into the lower compartment (solid or liquid).

Useful volumes: 150+250 µL

Closed system: mass measurement

Pressure: a few bars

4 Continous A + B reaction cells

These cells measure the enthalpy of mixing of 2 fluids in a continuous flow (heat of chemical reaction, heat of gas dissolution or enthalpy of excess of a liquid mixture). The measurement is carried out dynamically. An internal tubing system is used to equilibrate the fluids to the temperature of interest, then mixing takes place within the measurement system and is discharged outside the calorimeter. The heat measured is directly proportional to the flow rates and heats measured.

Continuous flow system

Isothermal measurements

Pressures: up to 100 bar (higher pressures on request)

Flow rates: up to 1mL/min

Specifications

Temperature range	from -40 to 160 °C
Scanning rate	0,001 to 5 °C/min
Temperature precision regulation	100µ °C
Measurement time	30 to 60 min
Sensors type	Peltier Elements
Unique features	Direct T sample measurement Joule effect calibration
Measurement range	+/- 150 mW
RMS noise	0.05 µWa
Equipment dimensions	L*w*h = 900*700*500 mm

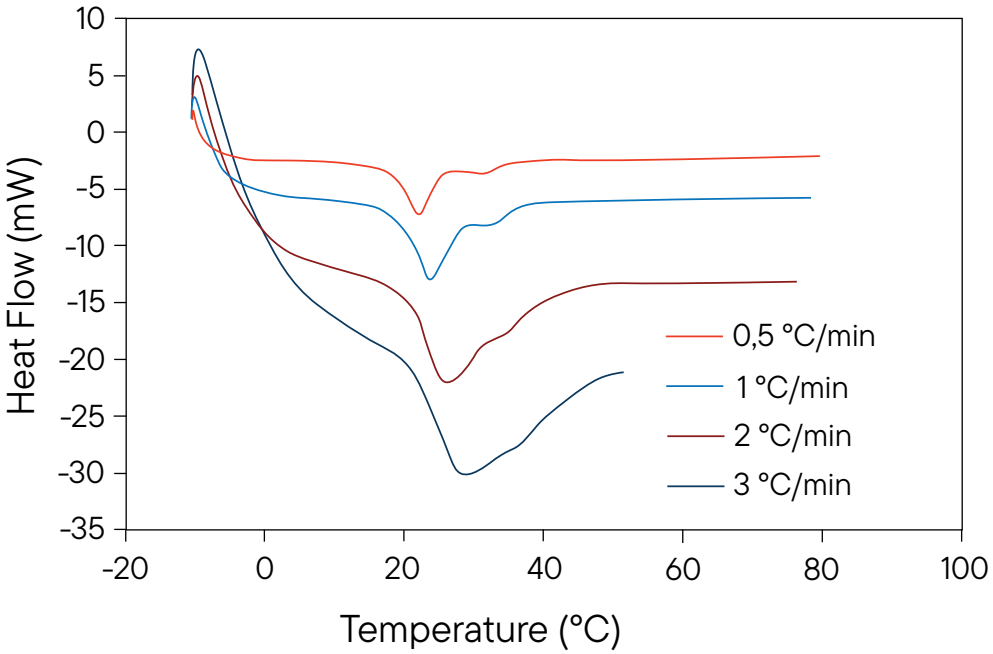
ULTIMATE MICRO CALORIMETER

Unique features

A wide temperature range
Cells adapted to your applications
Interchangeable sensor
Unrivalled accuracy and sensitivity

Applications

PTFE Analysis



A 524 mg PTFE cylinder was placed in the measurement cell while the reference cell remained empty.
The Ultimate Micro Calorimeter was programmed to perform several heating ramps between -10°C and 80°C, at scanning speeds of between 0.5 and 3°C/minute. The thermograms obtained are shown opposite.
At all the speeds tested, the two Teflon phase transitions were observed. The separation of the two transitions is all the more marked on the thermograms when the scanning speed is low.

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