LINSEIS

pushing boundaries

L63 DSC

Differential Scanning **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.

CLAUS LINSEIS

CEO DIPL. PHYS.

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.

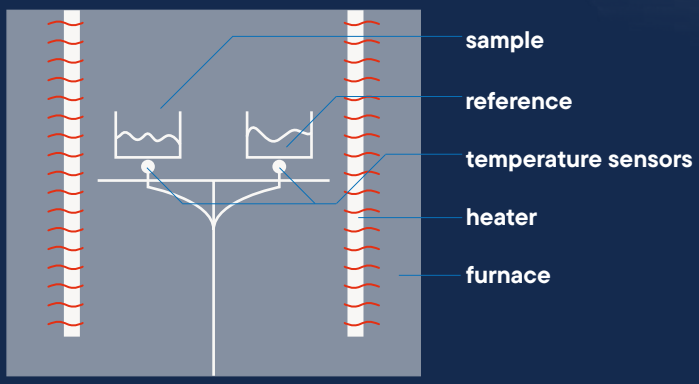
Differential Scanning **Calorimeter**

The Differential Scanning Calorimetry (DSC) is the most important thermal analysis technique to measure endothermic and exothermic transitions as a function of temperature.

The instrument is used to characterize polymers, pharmaceuticals, foods/biologicals, organic and inorganic chemicals. Transitions measured include glass transition, melting, crystallization, curing, cure kinetics, oxidation induction time and heat capacity.

Unsurpassed performance

- Unsurpassed sensitivity – for detection of melts and weak transitions
- Benchmark resolution – precise separation of close lying events
- Reliable automation – up to 96 position autosampler
- Widest temperature range – from -160 °C to 600 °C in one measurement



Accessories

DSC-sample-press

For optimum sample preparation of aluminum crucibles a ergonomic sample press is available.

Crucibles

Various crucibles made of aluminum, alumina, copper, gold, platinum and sapphire are available for measurements with the L63 DSC. Other crucibles are available on request.

User exchangeable Furnaces

The new user exchangable furnace can be replaced within a few screws. This innovative concept reduces the maintenance costs drastically

The LINSEIS Differential Scanning Calorimeters (DSC) operate in agreement with national and international standards such as: **ASTM C 351, D 3417, D 3418, D 3895, D 4565, E 793, E 794, DIN 51004, 51007, 53765, 65467, DIN EN 728, ISO 10837, 11357, 11409**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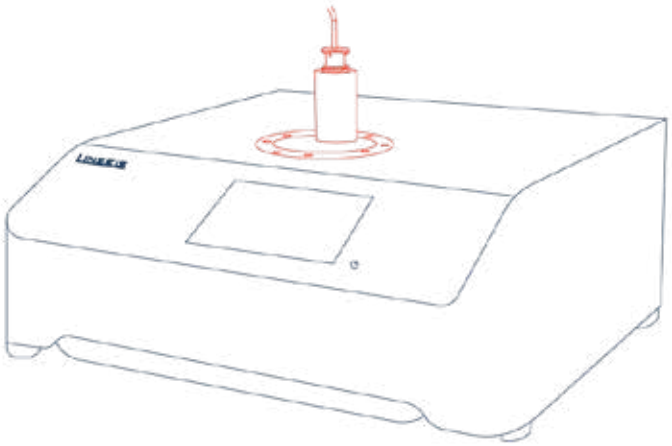
Hardware Options

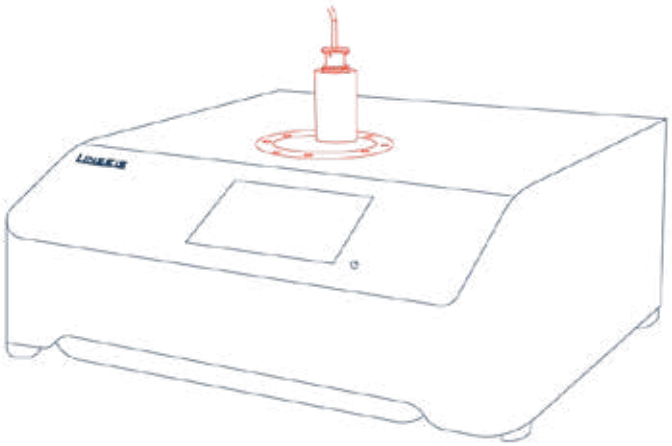
Optical DSC

The L63 DSC can be equipped with a CCD camera to observe the sample during the measurement. The visualization of the sample gives a much deeper insight to phase transitions and decomposition processes.



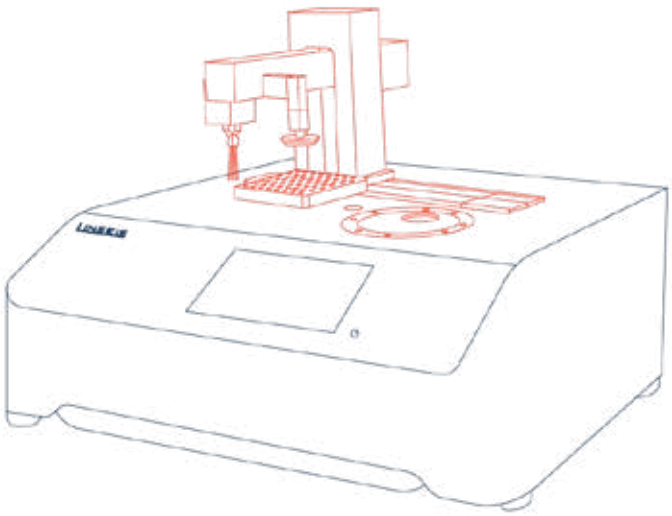
UV curing DSC

The Photo cell allows measurements under UV light to investigate UV curing systems. Due to the very short time constant, also fast UV curing reactions in the smallest time scale can be measured.



Sample Robot DSC

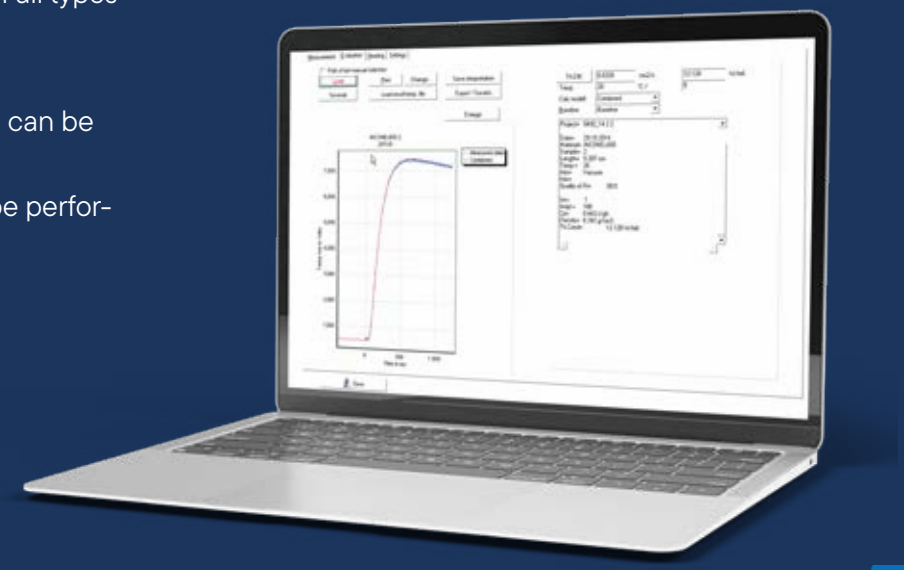
The sample robot for up to 96 samples increases the productivity significantly. The instrument can run automatically overnight or at the weekend. Together with the intuitive and intelligent software it reduces labour costs and saves time.



Software

The software greatly enhances your workflow as the intuitive data handling only requires minimum parameter input. AutoEval offers a valuable guidance for the user when evaluating standard processes such as melting and crystallization points. The optional thermal library product identification tool, provides a database permitting an automatic identification tool for your tested polymer. Instrument control and/or surveillance through mobile devices gives you control wherever you are.

- Software packages are compatible with latest Windows operating system
- Set up menu entries
- All specific measuring parameters (User, Lab, Sample, Company, etc.)
- Optional password and user levels
- Undo and redo function for all steps
- infinite heating, cooling or dwell time segments
- multiple language versions such as English, German, French, Spanish, Chinese, Japanese, Russian, etc. (user selectable)
- Evaluation software features a number of functions enabling a complete evaluation of all types of data
- Multiple smoothing models
- Complete evaluation history (all steps can be undone)
- Data acquisition and evaluation can be performed simultaneously
- Data can be corrected using zero correction
- Data evaluation includes: peak separation software signal correction and smoothing, first and second derivative, curve arithmetic, data peak evaluation, glass point evaluation, slope correction, zoom / individual segment display, multiple curve overlay, annotation and drawing tools, copy to clipboard function, multiple export features for graphic and data export, reference based correction.

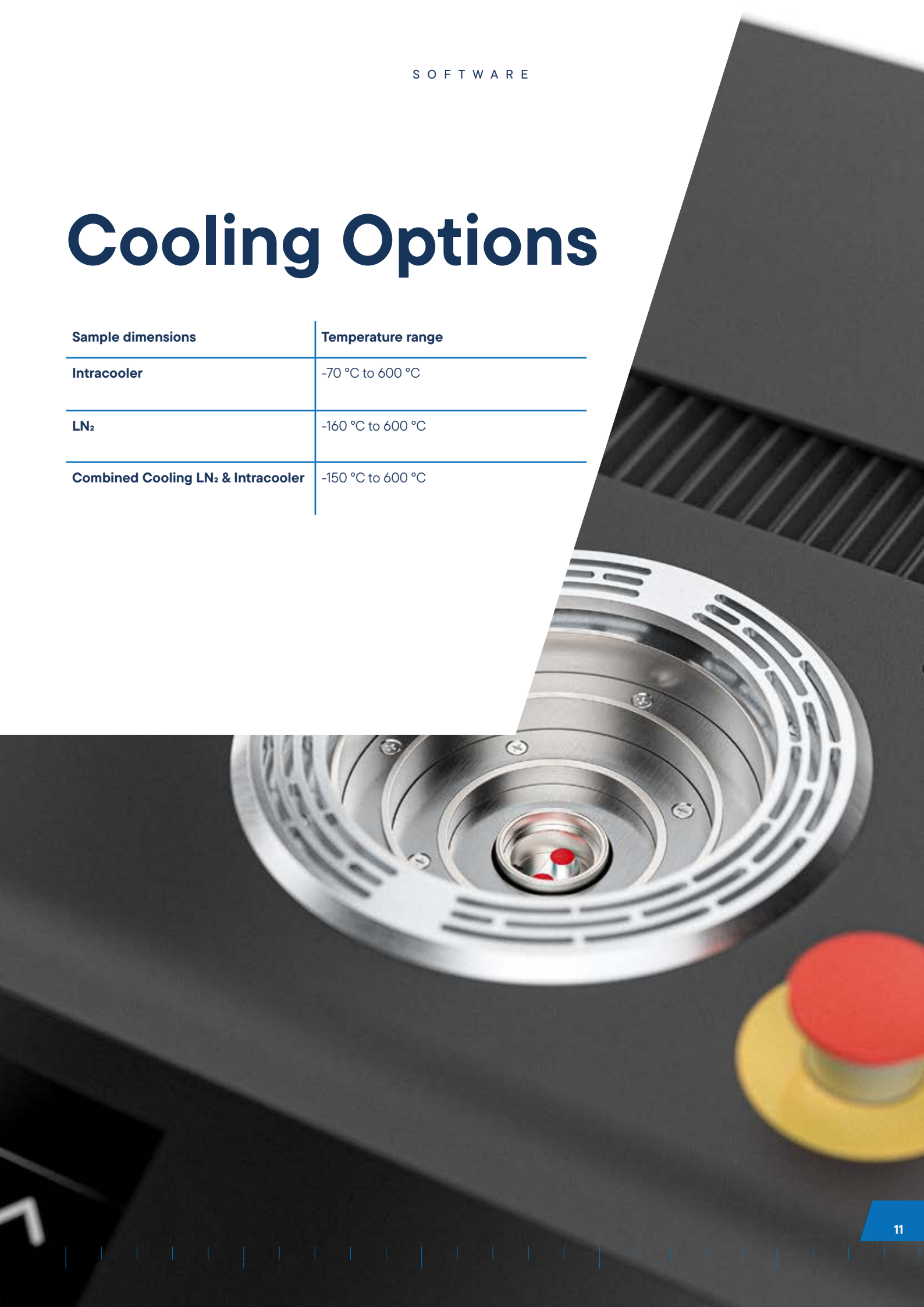


Technical Specifications

Heating rate	0.01 to 100 K/min
Cooling rate	Intra: 5 min (100 to 0 °C) LN2: 10 min (100 to -100 °C)
Replaceable heatsink	Yes
Replaceable furnace	Yes
Data capture	100 Hz
Temperature Accuary	±0,1 K
Enthalpy Precision	<1 %
Masuringe range	± 750 mW

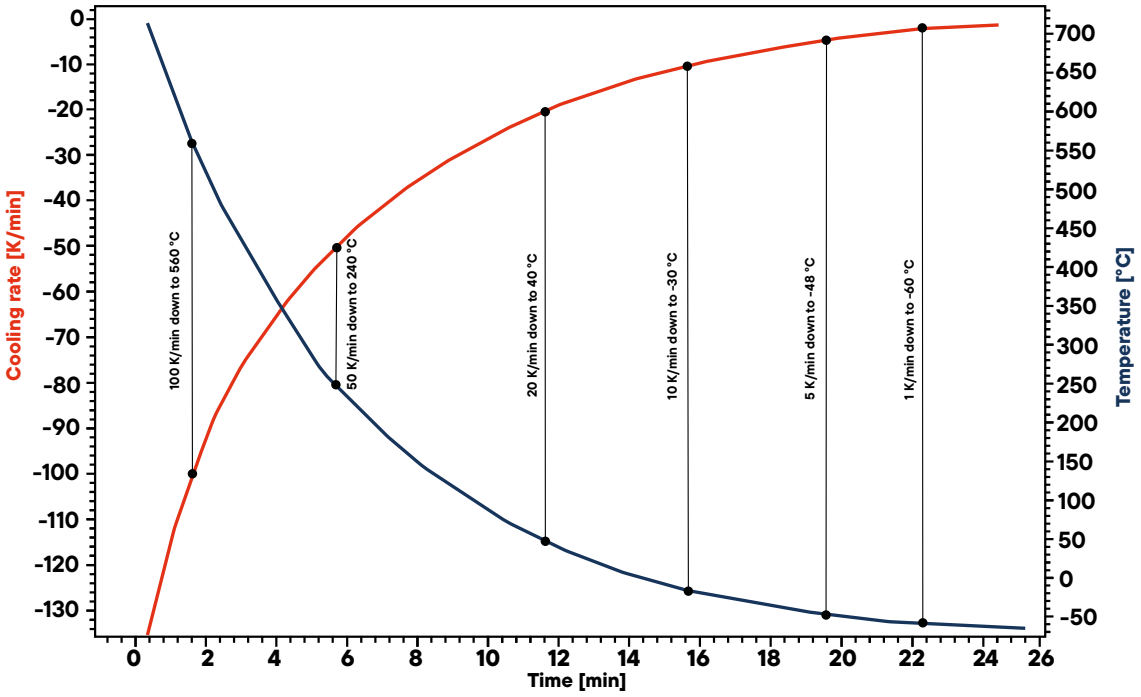
Cooling Options

Sample dimensions	Temperature range
Intracooler	-70 °C to 600 °C
LN_2	-160 °C to 600 °C
Combined Cooling LN_2 & Intracooler	-150 °C to 600 °C



Applications
L63 DSC

Cooling rate with an Intracooler

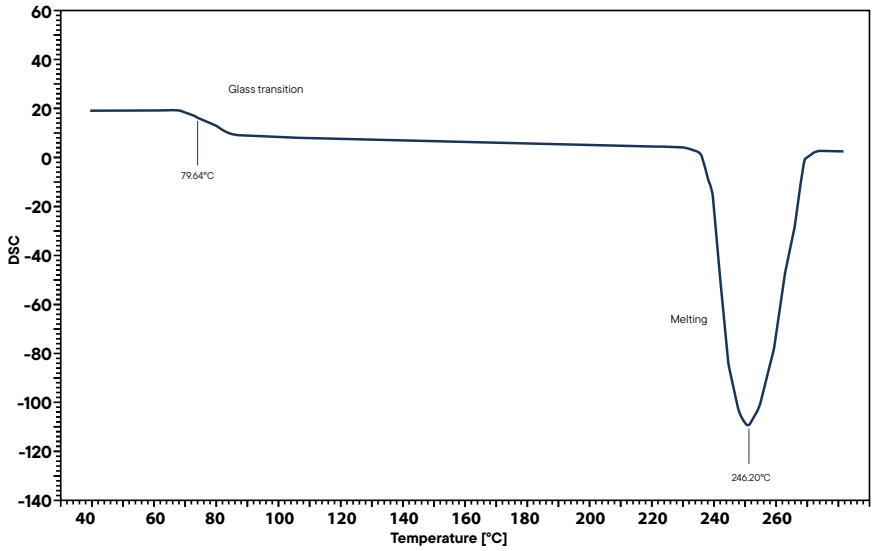


The new DSC system offers an innovative design with a wide temperature range from -60 °C to 700 °C, without the need for reconfiguring the cooling options. This allows for a more efficient workflow by eliminating time-consuming adjustments. The instrument enables seamless transitions between low and high temperatures, making it ideal for demanding applications such as material research, polymer analysis, and quality control. With its high flexibility and user-friendly operation, this DSC sets a new standard for advanced thermal analysis.

In the graph shown above, you can see how the intracooler ensures efficient and rapid cooling.

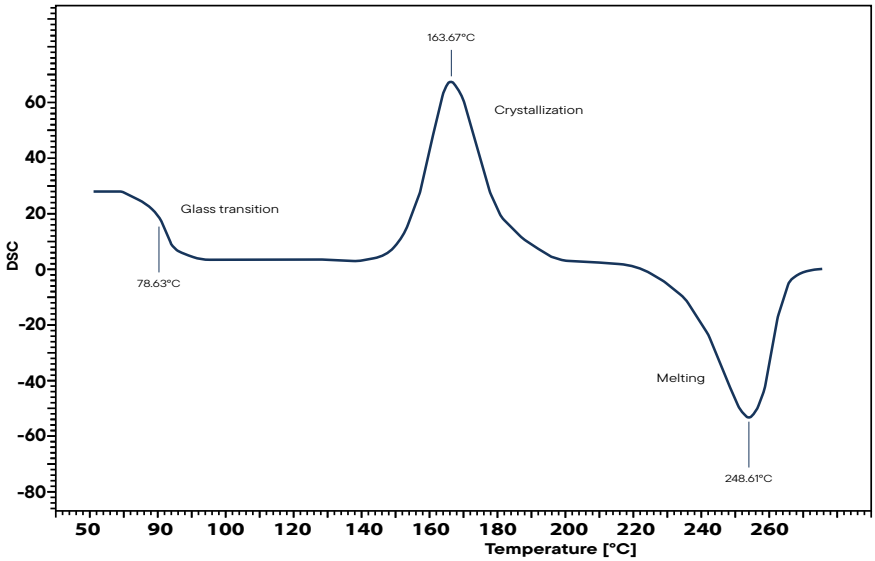
Cooling rate	Up to the lower temperature
100 K/min	560 °C
50 K/min	240 °C
20 K/min	40 °C
10 K/min	-30 °C
5 K/min	-48 °C
1 K/min	-60 °C

PET Granulate 1. Heating



The analysis of polymers is one of the main applications of DSC. Effects such as glass transitions, melting, and crystallization points are of interest and often challenging to detect. The new LINSEIS L63 DSC offers high resolution and sensitivity, making it an ideal instrument for this type of analysis. With its innovative design, it is now possible to analyze important properties of the sample even during the initial heating of the PET granulate using the L63 DSC at a linear heating rate of 20 K/min. The curve shows a significant glass transition around 80 °C, followed by a melting peak at 230 °C.

PET Granulate 2. Heating



Depending on the cooling rate, the degree of crystallinity of the polymer changes significantly. During a subsequent heating run, cold crystallization can only be observed with a linear heating rate of 20 K/min. The curve reveals a distinct glass transition around 80 °C, followed by cold crystallization of the amorphous regions starting at approximately 148 °C and a melting peak at 230 °C. This allows for complete characterization of the sample with just two heating cycles

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