



DSC CATALOGUE

Differential Scanning Calorimetry



About Us

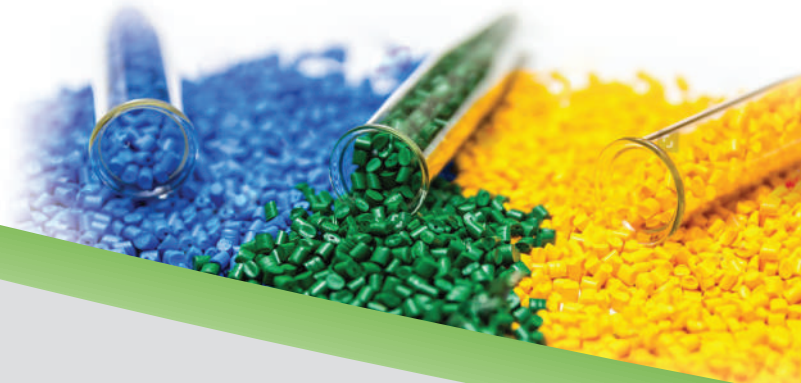
Dama Pajouh Arvin Co. as the first and largest knowledge-based company in the field of design and production of thermal analysis Instruments has started its activities since 2013 and with its specialists and experienced staff has been able to supply its advanced instruments such as **Dilatometer, DSC, TGA, STA, HSM** to the costumers at different temperatures.

Differential Scanning Calorimetry (DSC)

The Differential Scanning Calorimetry (DSC) is the most popular measurement technique to detect endothermic and exothermic transitions like the determination of transformation temperatures and enthalpy of solids and liquids as a function of temperature. Therefore the sample and reference are maintained at nearly the same temperature throughout the experiment and the heat flux will be measured. Working with DSC (Differential Scanning Calorimetry) involves not only the handling of a device, but also sample preparation, evaluation and interpretation of the resulting curves. The Differential Scanning Calorimeter are used to characterize polymers, pharmaceuticals, foods/ biologicals, organic chemicals and inorganics.



Three types of DPA DSC instruments are operated in accordance with the heat flow principle. They are characterized by a three-dimensional symmetrical design with homogeneous heating. Sensors with high calorimetric sensitivity, short time constants and a condensation-free sample chamber in the DSC cell ensure high detection sensitivity.



	DSC 301 LT/A	DSC 301 LT/S	DSC 301 HT
Temperature Range	RT to 400 °C	-170 to 600 °C	RT to 1450 °C
Measuring Range	± 100 mW	± 100 mW	± 200 mW
Heating Rate	0.1 -50 °C/min	0.1 -50 °C/min	0.1 -20 °C/min
Resolution	1 µW	1 µW	10 µW
Enthalpy Precision	± 0.2% for Indium	± 0.2% for Indium	± 0.5% for Indium
Gas Atmospheres	Inert, Oxidizing, Static and Dynamic		

Thermal Characteristics Which Can Typically Be Detected by Using DSC

- Melting temperatures and enthalpies (heats of fusion)
- Crystallization temperatures and enthalpies
- Glass transition temperatures
- Oxidative-induction time (OIT) and oxidative-onset temperature (OOT)
- Degree of crystallinity
- Reaction temperatures and enthalpies
- Cross-linking reactions (curing)
- Degree of curing
- Specific heat capacity
- Distribution of crystal molecular weight (qualitative, via peak shape)

Low-Mass Furnace for Fast Heating and Cooling Better Replicates Polymer

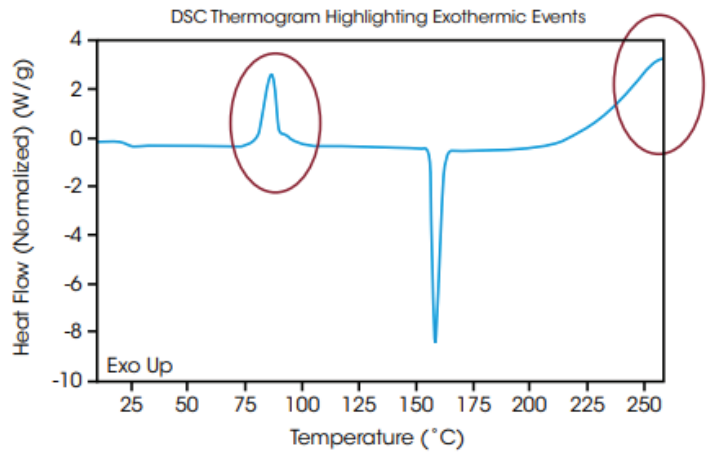
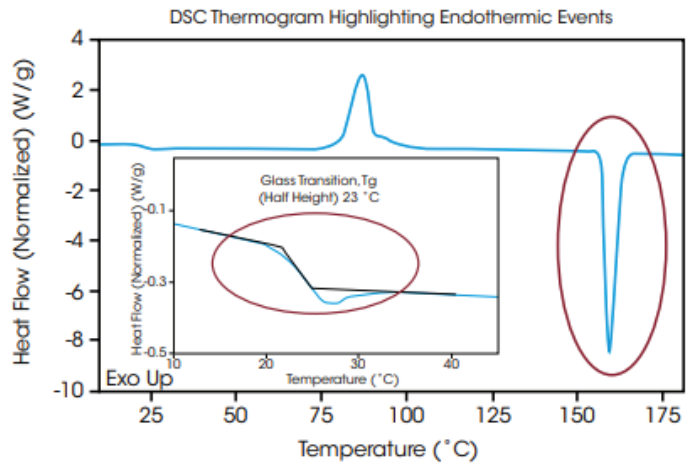
DPA DSC is equipped with the new furnace, the fastest furnace available for a heat flux DSC. It can heat at up to 100 K/min and cool at 50 K/min over a wide measurement range. This even allows for the measurement of isothermal crystallization or isothermal curing for kinetic studies where it is necessary to reach equilibrium conditions as quickly as possible. It is thus possible to replicate real processing conditions very closely in your DSC experiments. Additionally, one can speed up the measurements and thus save working time.



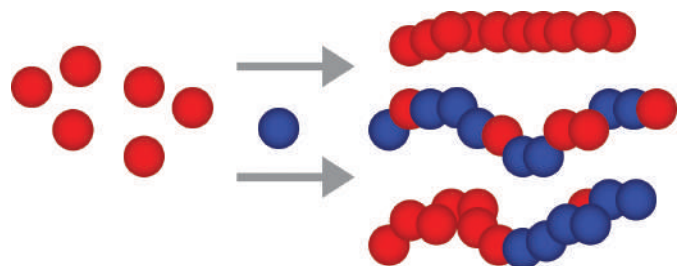


Endothermic Events

- Glass Transition
- Melting
- Evaporation/Volatilization
- Enthalpic Recovery
- Polymorphic Transitions
- Some Decompositions
- Crystallization
- Cure Reactions
- Oxidation
- Decomposition
- Freezing



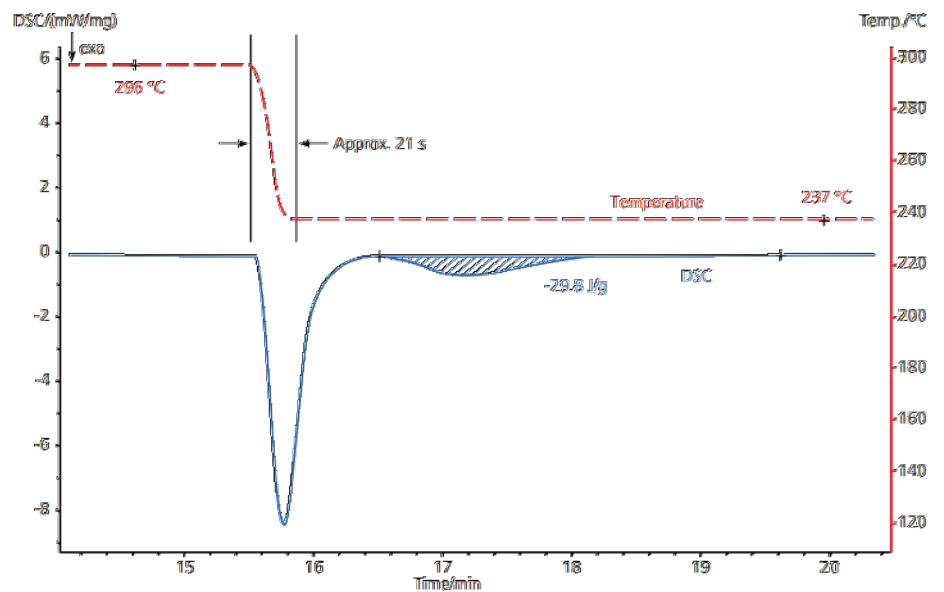
Polymerization



DSC 301 LT Ideal for Quality Control of Polymers

Isothermal Crystallization of a Semi-Crystalline Thermoplastic

Isothermal crystallization tests are often used to simulate the rapid cooling of polymer parts during production (e.g. Injection molding). The graph on the left depicts an isothermal crystallization experiment on PA66 GF30 (containing 30 wt% glass fiber) using the DSC 301 LT in combination with the LN2 cooling system. The low thermal mass of the new furnace allows for a temperature interval of almost 60 K to be bridged within seconds. Based on this, it is possible to separate solidification of PA66 from the starting phase of the isothermal segment. This clearly demonstrates the superior cooling performance of the heat-flux DSC 301 LT.



Isothermal crystallization of a semi-crystalline thermoplastic. 11.4 mg PA66 GF30 in a dynamic nitrogen atmosphere, intracooler for the temperature range -70°C to 600°C . The temperature curve is marked in red; the DSC curve in blue. The total crystallization enthalpy at 237°C amounts to approx. 30 J/g. Important for isothermal crystallization experiments is to avoid any temperature-undershoot while changing over from cooling to the isothermal phase.

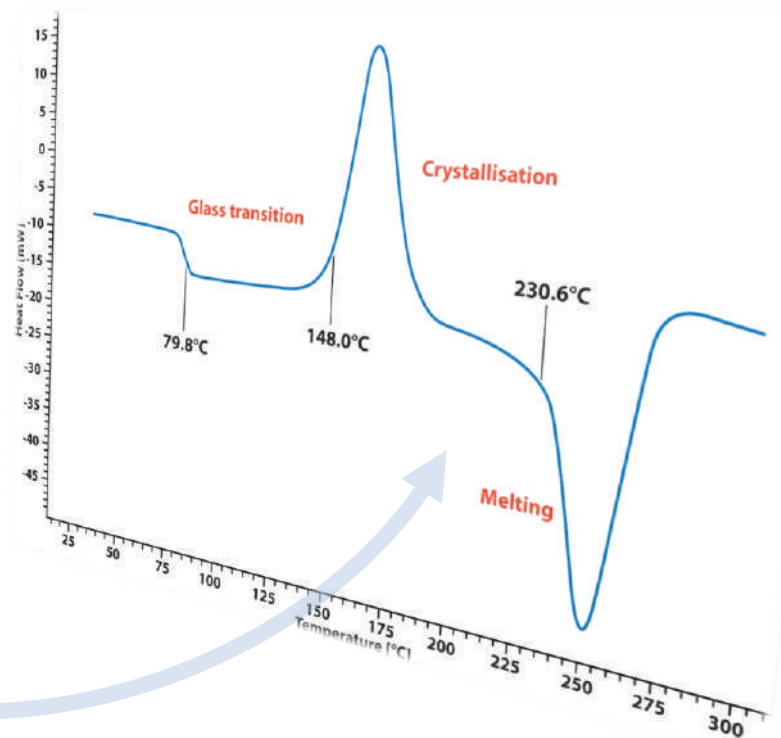
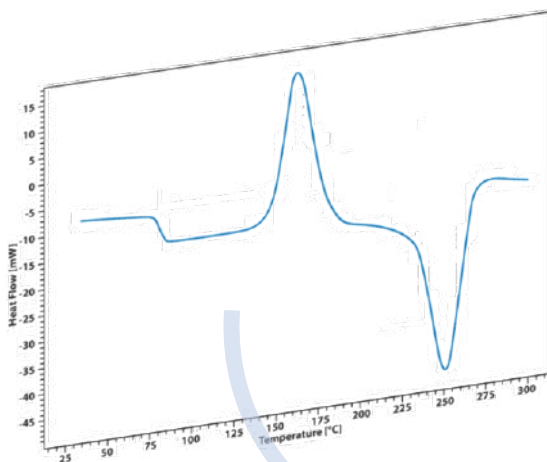




VENS Software

All Dama Pazhouh Arvin Thermo Analytical instruments are PC controlled. The individual software modules run exclusively under Microsoft® Windows® operating systems. The complete software consists of 3 modules: temperature control, data acquisition and data evaluation.

The VENUS software incorporates all essential features for measurement preparation, execution, and evaluation of a thermoanalytical measurement.





Venus

• VENUS Thermo Package Software

Software Features

General software features

- Comparison and/or evaluation of STA, DSC, TGA, DIL measurements in one plot
- Multi- tasking : simultaneous measurement and evaluation
- Calculation of 1st and 2nd derivative including peak temperatures
- Gas manager control
- Calibration and correction routines for temperature, sensitivity, baseline
- Context-sensitive help system
- Up to 256 programmable temperature segments
- Snapshot for online evaluation of the measurement in progress

DSC-specific features

- Comparison analysis of up to 30 curves/temperature segments from the same or different measurements
- Loading of single files and simultaneous loading of multiple files
- Determination of onset, peak, inflection and end temperatures, incl. automatic peak search
- Curve subtraction of baselines and sample runs; subtraction of physically identical curves
- Comprehensive glass transition analysis
- Degree of crystallinity ·
- OIT (Oxidative-Induction Time)




**Quality & Continues Improvement
Are
Our Top Priority**




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