TA Instruments
Product Overview Guide

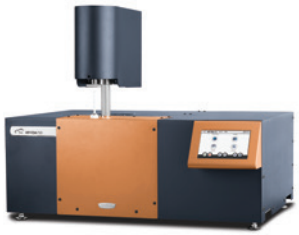
Performance, Quality & Support

THERMAL ANALYSIS

Discovery DSC 2500,250, 25 and X3

Discovery DSC 25P (High Pressure)

Discovery TGA 5500, 550 and 55



Discovery HP-TGA 7500, 750 and 75 (High Pressure TGA)

Discovery DMA 850

Discovery SDT 650 (Simultaneous DSC and TGA)

Discovery TMA 450

Discovery TMA 450 RH

Discovery SA (Vapor Sorption Analysis)

IsoSORP SA (High Pressure Sorption)

Thermal Analysis is important to a wide variety of industries, including polymers, composites, pharmaceuticals, foods, petroleum, inorganic and organic chemicals, and many others. Thermal analyzers typically measure heat flow, weight loss, dimension change, or mechanical properties as a function of temperature, pressure, time and atmosphere. Properties characterized include melting, crystallization, glass transitions, cross-linking, oxidation, decomposition, volatilization, coefficient of thermal expansion, and modulus. These experiments allow the user to examine end-use performance, molecular structure and mobility, composition, processing, and stability.

THE NEWEST DSC... DISCOVERY X3

The Discovery X3 Differential Scanning Calorimeter features a multi-sample cell that delivers high quality heat flow data for up to three samples simultaneously. The Discovery X3 DSC combines industry-leading performance with tools to increase productivity on every level of material research. TA Instruments' commitment to innovation enables scientists and engineers to reach their goals faster and make critical decisions with confidence.

RUN 3
DSC SAMPLES
at **ONCE**

RHEOLOGY

Discovery Hybrid Rheometers

ARES-G2

RSA-G2

A wide range of industrially relevant materials exhibit complex rheological behavior that determines processability, storage, and end-use performance. Rheometers measure and quantify the influence of viscoelastic flow properties on every stage of industrial production. TA Instruments rheometers offer unparalleled measurement sensitivity and accuracy to measure materials from low viscosity liquids to stiff solids in terms of viscosity, modulus, and elasticity or damping. A full range of environmental systems and measurement accessories, powered by SmartSwap™ technology for fast exchange & automatic configuration, provide the world's most versatile platform for rheological measurements.

NEW DISCOVERY HYBRID RHEOMETER – The MOST POWERFUL & VERSATILE RHEOMETER for your laboratory

The new Discovery Hybrid Rheometers are designed for scientists who need to obtain better rheological data, under the widest range of measurement conditions, collected by more users, with less training. Powerful, easy-to-use accessories allow you to replicate demanding environmental conditions, incorporate complementary simultaneous measurements, or extend your rheometer beyond conventional shear rheology. Discover the advanced engineering and attention to detail that provides enhancements in every aspect of rheometer technology and user experience.

Temperature & Environmental Control:

- Advanced Peltier Plate
- Dual Stage Peltier Plate
- Upper Peltier Plate (UPP)
- Electrically Heated Plates (EHP)
- Peltier Concentric Cylinder
- Electrically Heated Cylinder (EHC)
- Environmental Test Chamber (ETC)
- Relative Humidity

Advanced Accessories:

- DMA: Bending, Tension, Compression
- Tribology
- UV Curing
- Interfacial Rheology
- Interfacial Exchange Cell
- Modular Microscope Accessory (MMA)
- Small Angle Light Scattering (SALS)
- Extensional Viscosity Accessory
- Starch Pasting Cell
- High Pressure Accessory
- High Sensitivity Pressure Cell (HSPC)
- Dielectric Analysis
- Magneto-rheology
- Electro-rheology
- Rheo Raman Accessory
- Orthogonal Superposition (OSP)
- Immobilization Cell
- Building Materials Cell

MICROCALORIMETRY

Affinity ITC

Nano DSC

TAM IV

TAM Air

TA Instruments Isothermal Titration Calorimetry (ITC), Differential Scanning Calorimetry (DSC), and Isothermal Calorimetry systems (TAM) are powerful analytical techniques for in-depth characterization of molecular binding events and structural stability. Thermodynamic binding signatures from ITC not only reveal the strength of a binding event, but the specific or non-specific driving forces involved. Structural stability profiles from DSC reveal strengths and weaknesses in higher order structure and define the behavior of individual domains and their interactions.

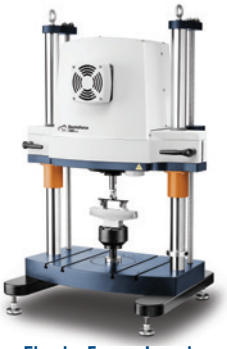
The ultrasensitive TAM IV is a configurable platform with a wide range of applications such as stability & compatibility, amorphicity assessment, microbial detection, and more.

We also offer the TAM Air, a robust microcalorimeter for the study of cement hydration processes in R&D and quality control among others.

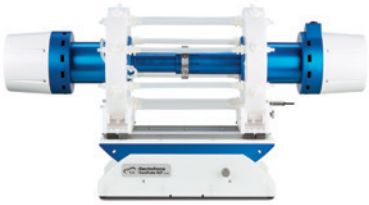
The TAM IV Micro XL is a powerful tool for measuring the electrochemical reactions occurring inside of a battery cell. Characterizing reactions occurring in a battery cell is critical to developing novel battery technology to address battery shelf-life and stability studies, as well as electrolyte and additive development. Experiments can be conducted under passive storage conditions or in conjunction with a battery cycler to evaluate battery charging and discharging dynamics. The TAM IV Micro XL is a real-time, non-destructive, and extremely sensitive measurement device for R&D and Quality Control.

TAM IV Micro XL

ELECTROFORCE® MECHANICAL TEST INSTRUMENTS



ElectroForce Load Frame Series with up to 15kN of Force



Fatigue Instruments for Medical Device Durability

DMA 3200 High Force DMA & Fatigue

TestBench Instruments

The ElectroForce Mechanical Test products have revolutionized mechanical testing by perfecting powerful and durable electromagnetic motor technologies. Over 25 years of innovations have resulted in the development of patented high-performance linear motors that feature zero-friction moving-magnet designs. The ElectroForce instruments all leverage this motor technology and enable development of materials, components and devices through evaluation of durability and mechanical characteristics with high levels of speeds, frequencies and precision. Explore for yourself the unique TA ElectroForce technologies that provide demonstrable benefits for your testing needs that range from versatile load frames and High-Force DMAs to specialized medical device fatigue solutions.

THERMAL CONDUCTIVITY

Discovery Laser Flash

Xenon Flash

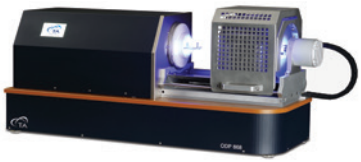
FOX Building Materials
Heat Flow Meters

Thermal Conductivity Meters

TA Instruments provides the most extensive and comprehensive range of instruments for the precise and accurate measurement of heat transfer properties over a wide range of material types and temperatures. Thermal conductivity, thermal diffusivity and specific heat capacity define a material's ability to store and transfer heat. A thorough understanding of these properties is critical for any process or material which experiences a rapid or significant temperature change, subjected to large temperature gradients, or for which temperature must be precisely controlled or maintained. Accurate values of these properties are essential for modeling and managing heat and may also reflect important information about material composition, purity and structure, and secondary performance characteristics such as tolerance to thermal shock.

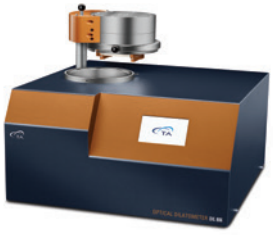
DILATOMETRY

Horizontal Dilatometers



Heating Microscope

Vertical Dilatometers



Optical Dilatometer

Quenching Dilatometers

TA Instruments Dilatometers are high-precision systems designed to measure dimensional changes of a specimen caused by changes in its thermal environment. Linear thermal expansion coefficient, annealing characteristics, sintering processes and other physical or chemical changes manifesting themselves as a change of dimensions can be precisely determined. Optimization of processing parameters as reflected by dimensional changes of the material can be studied in great detail through duplication of thermal cycles and rates used in the actual process. Due to the flexible programming of thermal cycles, complex processes can be easily simulated. In quenching dilatometry temperature programs with extremely high heating and cooling rates of up to several thousand degrees per second are precisely controlled to simulate, analyze and optimize metal heat treatment processes.

RUBBER TESTING

RPA *elite*, RPA *flex*, MDR *one*

MV *one*

ADT
(Automated Density Tester)

AHT
(Automated Hardness Tester)

Sample Cutter
RPA, MDR and Mooney Instruments

TA Instruments offers a complete line of instruments for the measurement of rheological and physical properties of polymers, rubber and rubber compounds at all stages of manufacture. The Rubber Process Analyzer (RPA) provides complete viscoelastic characterization of polymers and rubber compounds by distinguishing differences in polymer architecture that directly affect processing behavior, physical properties, stability, and quality of mix. Our family of rubber instruments also includes a Moving Die Rheometer (MDR) for rubber compound curing studies, Mooney Viscometer, Automated Density Tester and Automated Hardness Tester for all of your rubber testing needs.

LIQUID NITROGEN-FREE COOLING SYSTEMS

RCS 120 • RCS 90 • RCS 40

ACS-2 • ACS-3

Refrigerated Cooling Systems (RCS)

Take advantage of the convenient Refrigerated Cooling Systems (RCS) for unattended DSC and MDSC® operation over broad temperature ranges. The new RCS 120 provides enhanced safety and is the only liquid nitrogen-free system capable of conducting experiments down to -120 °C.

- One-, Two-, or Three-stage refrigeration systems that achieve temperature ranges down to -40 °C, -90 °C or -120 °C
- Sealed system eliminates the need for liquid nitrogen cooling
- Enables cycling, MDSC®, controlled, and ballistic cooling experiments
- Safe, convenient, and continuous cooling operation for your laboratory needs

Air Chiller Systems (ACS-2 and ACS-3)

The new Air Chiller Systems are unique gas flow cooling systems that enable sub-ambient temperature control without the use of liquid nitrogen. Equipped with multi-stage cascading compressors, the ACS-2 and ACS-3 enable testing to unprecedented temperatures as low as -55 °C and -100 °C, respectively. This flexible Air Chiller is available for use with the DMA 850, all DHR Rheometer models with ETC, ElectroForce Ovens, and the ARES-G2 Rheometer & RSA-G2 Solids Analyzer with FCO. Utilizing compressed air, the Air Chiller Systems can help eliminate or reduce liquid nitrogen usage from any laboratory and offers an incredible return on investment.

Industry-Leading **Sales** & **Support**

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Lindon, UT USA
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Solna, Sweden
Copenhagen, Denmark

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