

Product Overview

Thermal Analysis, Adiabatic Reaction Calorimetry, Determination of Thermophysical Properties



The Broadest Portfolio for Thermal Analysis



Differential Scanning Calorimetry (DSC) Differential Thermal Analysis (DTA)

-180°C to 2400°C

The various types of NETZSCH DSC instruments all work according to the heat flow principle. They are characterized by three-dimensional symmetrical construction with homogeneous heating. Sensors with high calorimetric sensitivity, short time constants and a condensation-free sample chamber in the DSC cell guarantee high detection sensitivity.



Thermogravimetric Analysis (TGA)

10°C to 2400°C

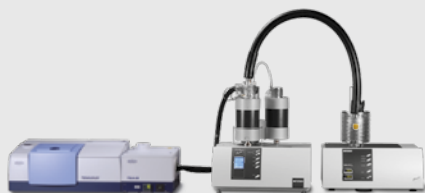
NETZSCH TGA instruments are equipped with digital balances and are vertically designed with a top-loading sample arrangement and direct temperature measurement at the sample.



Simultaneous Thermal Analysis (STA) TGA-DTA/TGA-DSC/TGA

-150°C to 2400°C

With the introduction of the STA 449 **F1** and **F3 Jupiter**® series, NETZSCH is setting new standards. Unlimited configurations and unmatched performance are the foundations for a great variety of application possibilities in fields such as ceramics, metals, plastics and composites over a broad temperature range.



Evolved Gas Analysis (EGA)

By coupling the thermal analysis instrument with a Quadrupole Mass Spectrometer (QMS 403 C *Aëolos*® or SKIMMER®), GC/MS or FTIR (Fourier Transform Infrared Spectrometer by BRUKER Optics), the detection of evolved gases and identification of the separated components can be precisely time correlated with the thermal analysis signals.



Dilatometry (DIL)

-180°C to 2800°C

When it comes to the determination of linear thermal expansion in solids, liquids, powders, pastes or fibers, the DIL 402 series of pushrod dilatometers leaves no measurement problem unsolved. The interchangeable furnaces cover all applications for high-precision expansion control in many fields, including high-tech ceramic and metallic materials in the areas of material development, basic research and quality control.

Thermomechanical Analysis (TMA)

-150°C to 1550°C

The new TMA 402 **F1** and **F3 Hyperion**® have been developed for the highly precise measurement of dimensional changes to the specimen as a function of temperature under a defined load. A wide variety of sample holder types and a double furnace hoist make the *Hyperion*® the most flexible TMA on the market.



Dynamic Mechanical Analysis (DMA)

-170°C to 600°C

The robust construction of the DMA 242 C and the high resolution of its deformation measuring system enable precise measurements on both very rigid and very soft samples. The widest variety of deformation types, the digital signal filtering and frequency extrapolation make the DMA 242 C the most versatile system for measuring visco-elastic properties of polymers and composites.



Cure Monitoring by Dielectric Analysis (DEA)

-150°C to 400°C

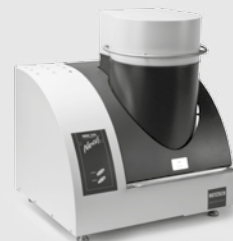
For the investigation of thermosetting resins, composites, adhesives and paints, Dielectric Analysis has stood the test of time. NETZSCH offers single and multiple-channel DEA systems for measurement of the ion conductivity.



Adiabatic Reaction Calorimeter (ARC®/APTAC/MMC)

RT to 500°C

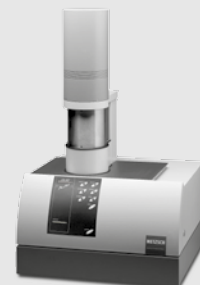
The new MMC 274 *Nexus*® is a hybrid between a DSC and an ARC® (Accelerating Rate Calorimeter), allowing mixing, injection and venting during measurements. This produces excellent heat capacity and pressure data as a function of temperature. Additionally, our well-proven ARC® 244 and 254 are higher-end systems for the investigation of process safety under adiabatic conditions. Our APTAC 264 also allows pressure tracking during exothermic reactions.



Laser Flash Apparatus (LFA)

-125°C to 2800°C

Thermal conductivity and diffusivity are the most important thermophysical material parameters for the description of the heat transport properties of a material or component. For the measurement of thermal diffusivity, the Laser Flash technique has proven itself as a fast, versatile and precise absolute method. NETZSCH offers three LFA models, covering the widest spectrum of materials and temperatures.





Heat Flow Meter (HFM)

-20°C to 90°C

With the HFM 436 *Lambda*, the thermal conductivity of insulating materials can be measured. Patented plate temperature control yields unmatched testing speeds and highly accurate results. The *Lambda* instruments are ideal for QC/QA and meet all required industrial standards.



Guarded Hot Plate (GHP)

-160°C to 700°C

The GHP 456 *Titan*® allows determination of the thermal conductivity of insulation materials with outstanding reliability and accuracy across a broad temperature range. Innovative plate materials and temperature sensors, special design features and an improved data acquisition and control system make this GHP the new benchmark in the field of insulation testing.



Refractory Testing by RUL/HMOR/TCT/PCE

RT to 1700°C

Special strength-testing methods have been established for refractory ceramics. The Refractoriness under Load (RUL) and Creep in Compression (CIC) identify the deformation resistance of a test piece under a defined load and temperature/time factors. The Modulus of Rupture (HMOR) at high temperatures is determined as the amount of force applied to a rectangular test piece until failure occurs. The softening behavior of these heterogeneous ceramics is determined indirectly through comparison with Seger cones (PCE - Pyrometric Cone Equivalent). Thermal conductivity can be measured directly with the TCT 426.

Leading Thermal Analysis

When it comes to Thermal Analysis, Adiabatic Reaction Calorimetry and the determination of Thermophysical Properties, NETZSCH has it covered. Our 50 years of applications experience, broad state-of-the-art product line and comprehensive service offerings ensure that our solutions will not only meet your every requirement but also exceed your every expectation.

The NETZSCH Group is an owner-managed, internationally operating technology company headquartered in Germany.

The three Business Units – Analyzing & Testing, Grinding & Dispersing and Pumps & Systems – provide tailored solutions for highest-level needs. Over 2300 employees at 130 sales and production centers in 23 countries across the globe guarantee that expert service is never far from our customers.

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