

TURN UP THE HEAT ON
**THERMAL
ANALYSIS**



Pyris™ TGA 9, DSC 9, and STA 9
Next Gen Thermal Analysis Instruments

All The Elements of Thermal Analysis in Perfect Balance

Research scientists and QA/QC analysts need high-resolution data to uncover the subtle intricacies of material behavior, whether it be raw materials or composites. They often face the challenge of complex instrumentation and unreliable data. They must also navigate the pressures of rapid, accurate testing cycles and stringent regulatory requirements, all while ensuring the thermal analysis instruments deliver consistent and reliable results.

PerkinElmer harnesses 60 years of expertise to transform thermal analysis, unveiling the **Pyris™ TGA 9, DSC 9, and STA 9** systems: a new generation of compact, durable, high-resolution, and low-maintenance thermal analysis systems. Our groundbreaking interchangeable furnace design enhances versatility, enabling your lab to do more with less. The intuitive touchscreen interface simplifies instrument operation, significantly enhancing productivity.

With industry-leading temperature control and rapid heating, our instruments grant superior precision and control. Experience streamlined workflows and deeper analytical insights with our comprehensive hyphenation solutions, all from a single, trusted source.

The modular design across the Pyris series ensures ease of troubleshooting and maintenance, bolstered by a unified electronics module and a single gas system for operational simplicity and increased reliability. New balance design for lower gas consumption ensures low maintenance and improved ESG .

Turn Up the Heat on Innovation With TGA 9 and STA 9

The **TGA 9 and STA 9** provide detailed thermogravimetric analysis across an extensive temperature range, ensuring precise quantification and characterization of samples, raw materials, and composites. Their compact, robust design integrates a durable furnace and a responsive touchscreen, enhancing productivity and offering outstanding value. The design features an alumina furnace, celebrated for 25 years of reliability, alongside a sensitive balance. The inclusion of a 48 position autosampler revolutionizes your workflow, enabling automated analysis and freeing up valuable time. Enhanced with direct temperature control via a responsive touchscreen, these systems significantly reduce sensor lag, delivering superior data quality and reliability. The STA 9 offers differential thermal analysis, enabling measurement of melting points, glass transitions, alongside gravimetric data.

Transition to Better Characterization With DSC 9

The new DSC 9 revolutionizes high-temperature Differential Scanning Calorimetry (DSC) analysis, and offers a dependable, user-friendly DSC system without compromising on performance. Engineered to fulfill stringent ASTM standards, including the Oxygen Induction Time (OIT) test, this instrument combines a high-capacity stainless-steel furnace on a copper base, capable of reaching up to 750°C. This ensures comprehensive analysis and unparalleled insights into a variety of samples. The DSC 9's compact and robust design integrates enhanced direct temperature control, elevating the quality of DSC analysis. The DSC 9 system delivers exceptional value, characterized by its ease of maintenance, compliance with ASTM standards, and a durable build designed for prolonged and intensive use.



TGA 9/STA 9

Sharing a common design, the compact TGA 9 and STA 9 double thermal analysis capability and deliver all the performance you need. The innovative STA 9 provides real-time sample weight and heat flow measurements, ideal for both research and routine tasks. Its advanced sensor technology and compact design make it perfect for characterizing inorganics, analyzing polymers, or testing oils.

Robust Furnace

Robust and compact furnace that gives you improved temperature control, fast heating and cool-down time, and precise measurements.

Intuitive Touchscreen

Start and stop the instrument along with other basic control functions, right from the responsive touchscreen on the instrument.

Interchangeable Furnace

Modular design with interchangeable furnaces between TGA and STA instruments offers great flexibility and versatility for budget-constrained labs.

Unattended Operation

48-position autosampler for single sample autoloading or for overnight multiple sample analysis.

Sensitive Balance

Highly sensitive top-loading balance for unmatched performance, easy sample loading and unloading.

STA 9

With the power to acquire both TGA and DSC measurements simultaneously, the compact instrument delivers high performance thermal analysis across the widest range of applications. From compositional analysis to kinetic studies, the STA 9 is a real laboratory workhorse, enabling high temperature thermal analysis for fuel cell, ceramics, catalysis applications and challenging academic research.

The STA 9 is equipped with our leading edge SaTurnA™ sensor technology, which measures both sample and reference temperatures to ensure high precision and accuracy.

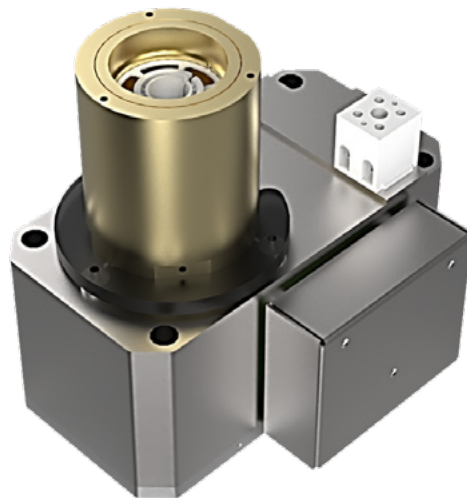
From TGA

- Compositional analysis – quantitative content analysis
- Decomposition temperatures
- Engine oil volatility measurements (TGA Noack test)
- Filler content
- Flammability studies
- Lifetime predictions (via TGA kinetics software)
- Measurement of volatiles (e.g. water, oil)
- Oxidative stabilities
- Thermal stabilities
- Catalyst and coking studies
- Hyphenation to identify products

From DSC

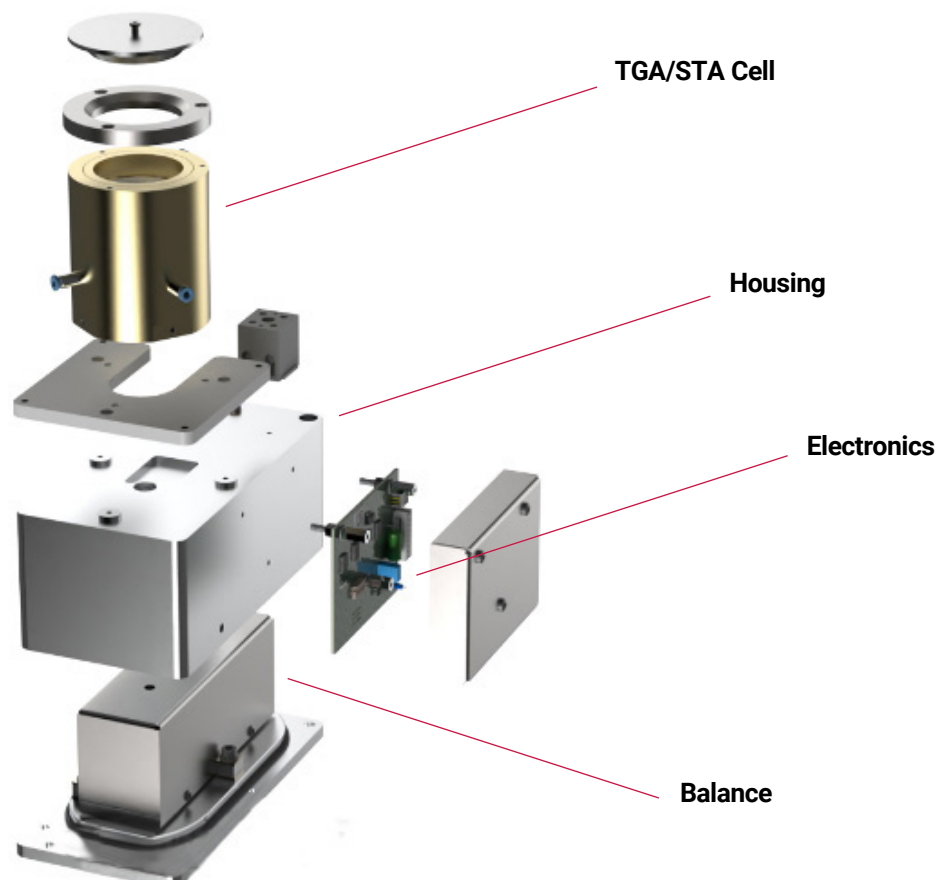
- Melting/crystallization behavior
- Glass transition temperatures
- Transition and reaction enthalpies

TGA 9/STA 9 Furnace Assembly



Improved Air Tightness

Improved sealing between subassemblies



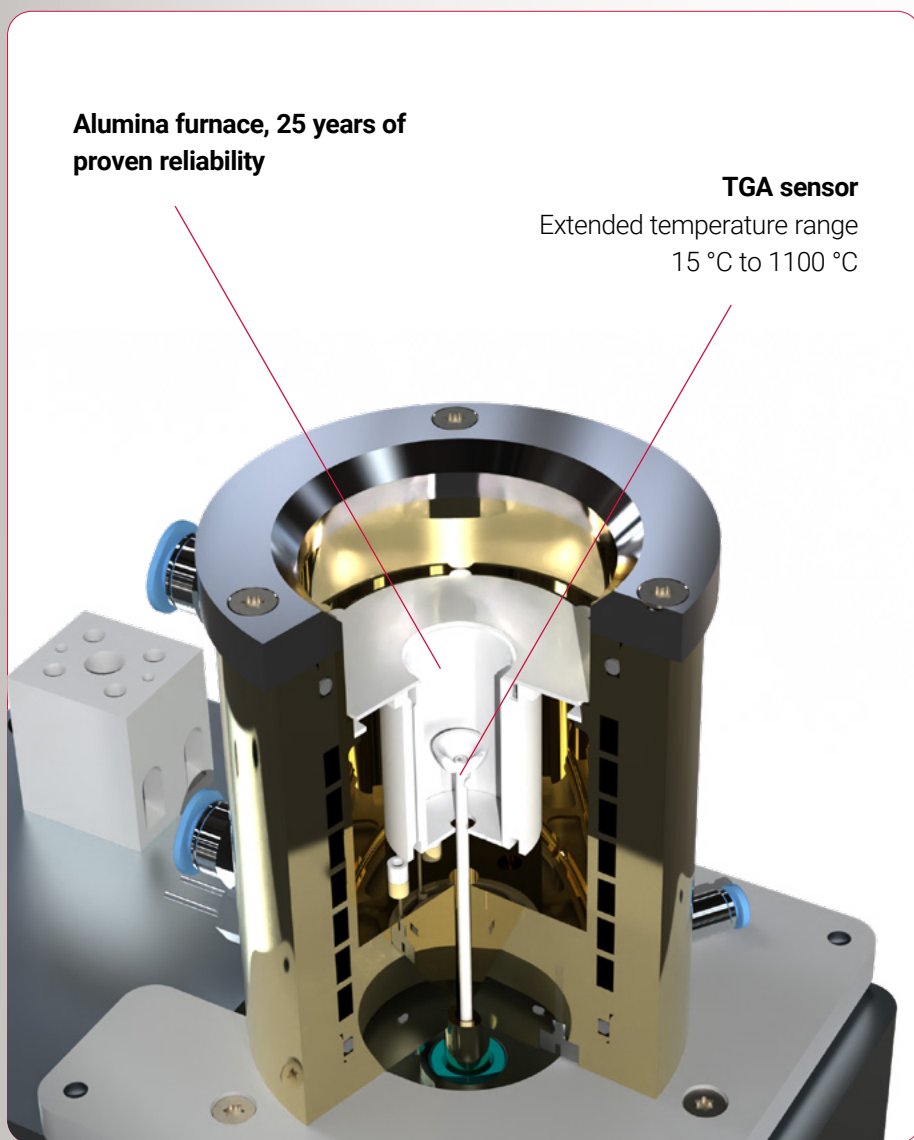
TGA/STA Cell

Housing

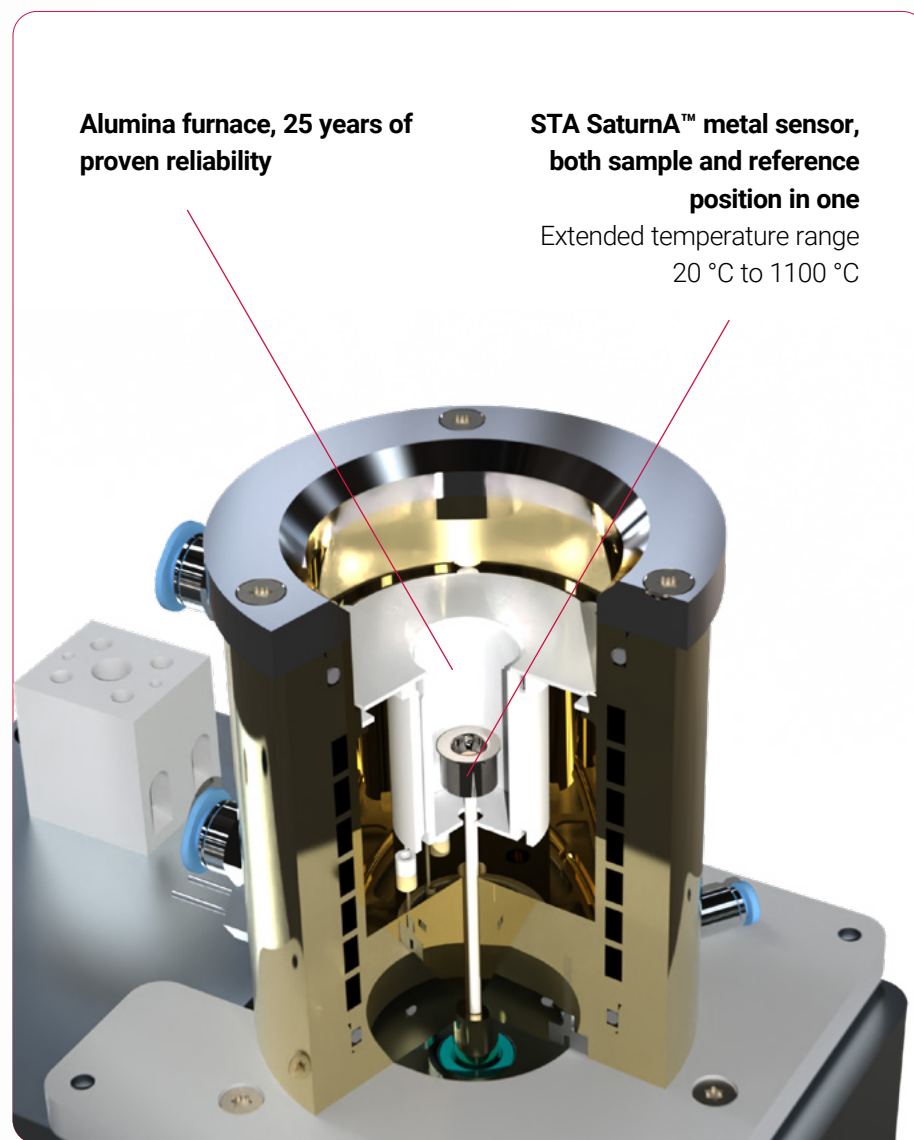
Electronics

Balance

TGA 9 Assembly



STA 9 Assembly



DSC 9

The new DSC 9 is a robust and compact workhorse that performs like a champion. It's the single-furnace solution you can depend on for a wide range of routine and traditional materials characterization research applications in the academic, polymer and pharmaceutical markets.

New Furnace Design

Robust and compact furnace that gives you improved temperature control and precise measurements.

Meet ASTM Standards

Precise measurement of parameters like melting points, thermal stability, and purity essential for meeting rigorous quality and safety criteria.

Increased Temperature Range

Best-in-class heating and ramping up to 750 °C for analysis of diverse samples.

Unattended Operation

48-position autosampler for single sample autoloading or for overnight multiple sample analysis.

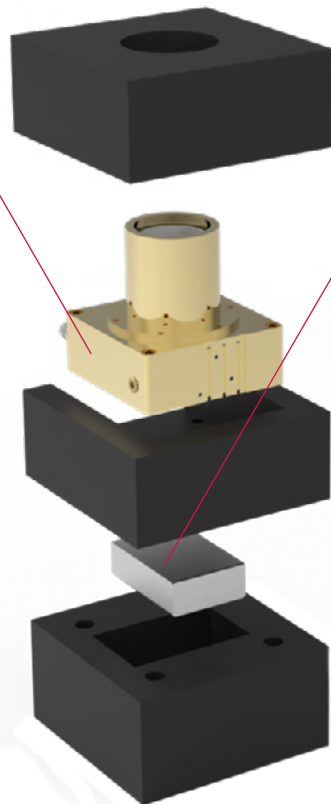
Direct Temperature Control

More accurate control and measurement of both furnace and sample temperature, giving you greater confidence in results.

DSC 9 Furnace Assembly

DSC 9 cell

Extended temperature range
-180 °C to 750 °C



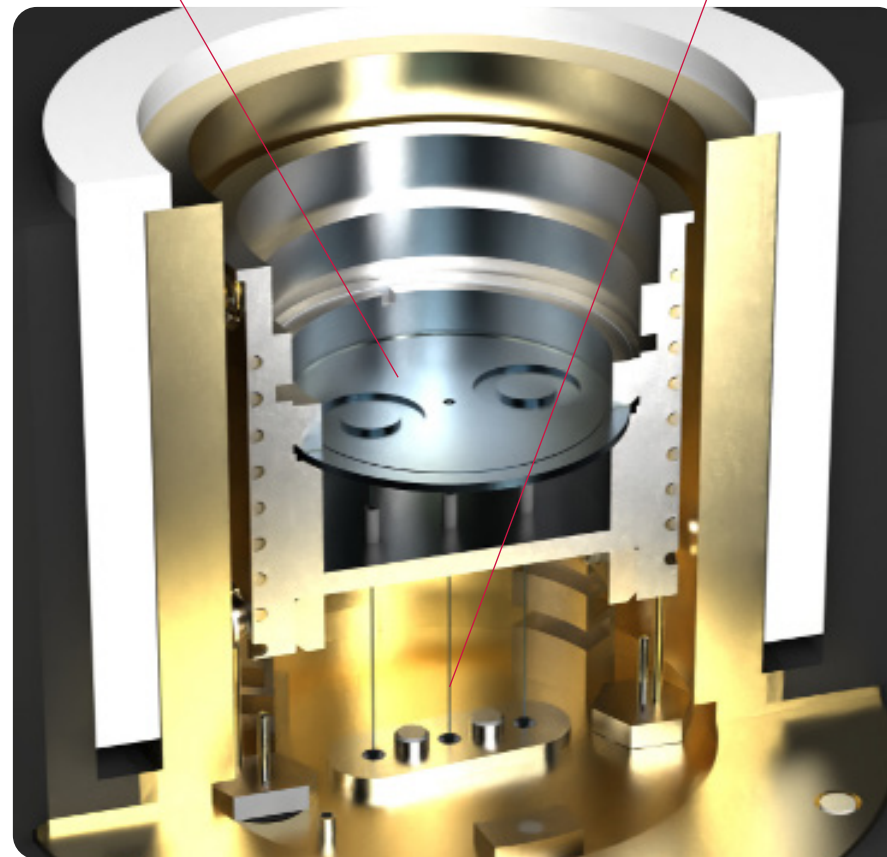
Cell electronics

Calibrations and corrections
stored on measuring cell PCB
For easier cell replacement

Stainless steel on a copper base

New temperature sensor

Direct temperature control



Go Further With the Power of Hyphenation

Accelerate your research with the PerkinElmer Hyphenation System, a modular, multimodal TGA, IR, and GC/MS solution managed by an electronic control panel, enabling complete sample characterization with minimal sample prep. With its automation features and functionality, your research can benefit from greater efficiencies and lower maintenance costs. And it delivers sample information and insights that can provide a real competitive advantage that is simply not available with single-system analyses. And you can rely on a single partner, every step of the way – from installation to application support. Learn about our rich history in hyphenation below.



Thermal ▶▶▶

TGA 7

Introduced the first hyphenation-ready thermal system – built-in multitasking computer

PYRIS 1

The first TGA with anticonvention tubing and long-lasting glassware

TGA 4000/STA 6000

TGA 4000: Temperature control for accurate results, fast sample purge and cooldown
STA 6000: Simultaneous thermal performance, reliability, and productivity

TGA 8000

Designed for hyphenation with autosampler

TL Series

New controller and transfer lines for hyphenation

EGA 4000

First single-supplier, fully integrated TG-IR – winner of the R&D World 100 Award

Infrared ▶▶▶

1700 FTIR Spectrometer

First microprocessor-controlled FTIR, with rotating mirror-pair design

Spectrum GX FTIR

With first-ever validated FTIR software, Spectrum for Windows®

Spectrum™ One FTIR

With patented DynaScan interferometer, the first FTIR with smart accessory recognition and validated FTIR software (Spectrum for Windows®)

Spectrum 100 FTIR

Incorporated smart accessories for efficient analysis of a wide range of samples

Spectrum 400 FTIR

First with automated phase switching

Spectrum Two FTIR

First portable, low-maintenance FTIR for everyday use – with application packs and powerful software

Frontier FTIR

High-performance FTIR/FT-NIR for high-demand environments

Spectrum 3 FTIR

Tri-range system with top fast-scan performance

Gas Chromatography ▶▶▶

AutoSystem™ XL GC with TurboMass™ Software

GC with precise induction interfaced with quadrupole benchtop MS

Clarus GC/MS

Perfect combination of high-performance GC and mass spec software

GCMS 2400™ Platform

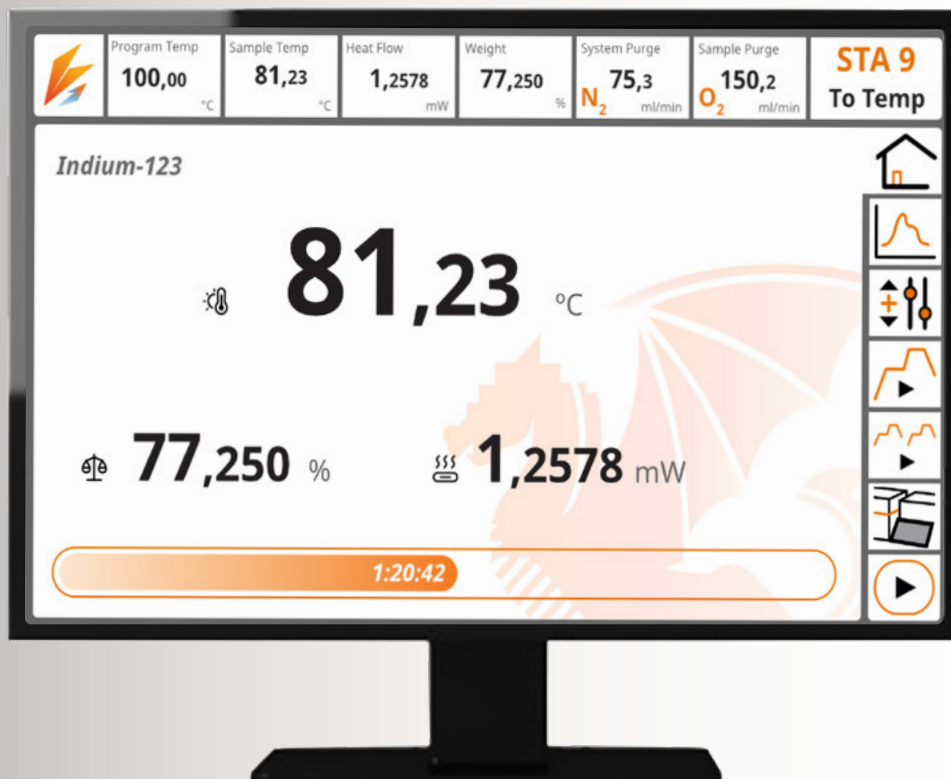
Innovative platform combined with detachable touchscreen and smart sampling capabilities

Powerful and Intuitive Software

Your PerkinElmer thermal analysis instruments and data come to life on the Pyris™ software platform – the benchmark application for thermal analysis. Pyris is the preferred choice in thermal analysis because it is intuitive and user-friendly and provides a wide-range of standard features and capabilities for maximum flexibility. PerkinElmer's family of highly sensitive thermal analysis instruments have been standardized on this powerful software platform.

Pyris software is easy to use without losing capabilities. The software has been designed to allow you to conduct data acquisition and analysis in one window and run multiple analyzers simultaneously.

A wide range of analysis options, data import/export flexibility and customizable features are provided to meet a wide range of needs.



The new Pyris Touch software powered by an Android touchscreen enables basic controls of the instrument such as:

- Start & Stop the instrument
- Extend temperature
- Control autosampler

Industrial

UV Curving of Polymers

The DSC 9, paired with a UV light source, enables precise measurement of curing temperatures and calorimetric data for resins under controlled temperature and light conditions. This aids in optimizing photo-initiator concentration and processing parameters for product development and scale-up.

Analysis of Recycled Polymers

The PerkinElmer TGA 9 efficiently measures properties like degradation temperature, moisture, and ash content in polymers. For parameters like melting point, the STA 9 delivers simultaneous weight loss and heat flow data. For precise calorimetric values and thermal transitions, such as glass transition temperature and curing temperature, the DSC 9 offers a high-performance workflow.

Oxidative Induction Testing

OIT measures the oxidative stability of polymers, indicating how well they resist aging due to environmental factors like heat and oxygen. Antioxidants are added to plastics to slow this aging process. The exothermic reaction between polymers and oxygen makes DSC an ideal method for such studies.



Pharmaceuticals

Free and Bound Solvent/Water

Thermogravimetric analysis with the PerkinElmer TGA 9 is crucial for determining free and bound solvents or water in pharmaceuticals, offering insights into formulations through its high sensitivity.

Weight Loss on Drying

Weight loss on drying is a key parameter of pharmaceutical formulations. Thermogravimetric analysis allows for optimization of pharmaceutical drying by allowing users to employ a variety of heating rates and isothermal holds while measuring the weight of the sample under a different purge atmospheric conditions.

Thermal Degradation

A key aspect of the characterization of pharmaceutical ingredients is the degradation temperature which can be determined under different conditions using the PerkinElmer TGA 9.



Materials

Ceramic

Porcelain clay, used for products like sinks and ceramics, contains kaolin, feldspar, and silica. The STA 9 measures moisture and kaolin content via weight changes, and heat flow data to determine the structure of the final product by analyzing reaction or crystallization products.

Geological

TGA and STA analyses are used to characterize geologic materials by simultaneously measuring heat and weight changes, preventing misinterpretation. These methods identify water loss from hydrates and CO₂ from carbonates, and characterize chemical reactions in various atmospheres through emitted or absorbed heat and weight changes.

Construction

Inorganic cement's strength varies with its mix and setting conditions. The STA 9 effectively characterizes the hydrate and carbonate mix from setting. Past failures, like the 1960s high alumina cement collapse, show the importance of proper testing. STA technology offers quick, reliable analysis of cement's safety by measuring both weight loss and heat flow.



Precision Engineered Consumables

The consumables for our latest range of thermal analysis instruments are designed with you in mind, with each fit to perform and manufactured with the highest quality materials available.

Whether you're looking for sample introduction components or standards, we have the consumables you need to keep your instrument up and running smoothly and efficiently.



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