



BETTER CHARACTERIZATIONS  
START WITH BETTER CONTROL



**TGA 8000™**  
Thermogravimetric Analyzer

  
**PerkinElmer®**  
*For the Better*



## It's all about sample atmosphere control

The TGA 8000 gives you the confidence that comes with total control of your sample atmosphere, both temperature and gas. Our furnace's temperature control system creates a wide effective temperature range – from subambient to 1,200 °C. The system delivers heating rates from 0.1 °C to 500 °C/minute to address the widest range of applications, and its low mass and forced-air cooling allow it to cool quickly for fast sample turnaround.

For sample gas environment, the system provides two integral mass-flow controllers for balance and sample purge. Built-in gas switching from Pyris™ software makes switching easy, while optional gas mixing allows the blending of up to three reaction gases, with delivery direct to the sample area.

## The Power of TGA

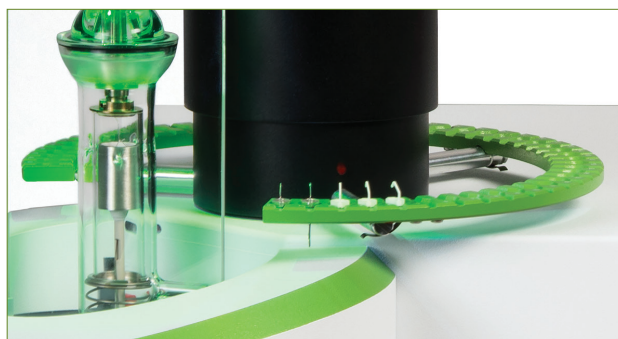
TGA measures the change in mass of the sample as it's heated, cooled, or held at a constant temperature in a controlled atmosphere.

### Applications

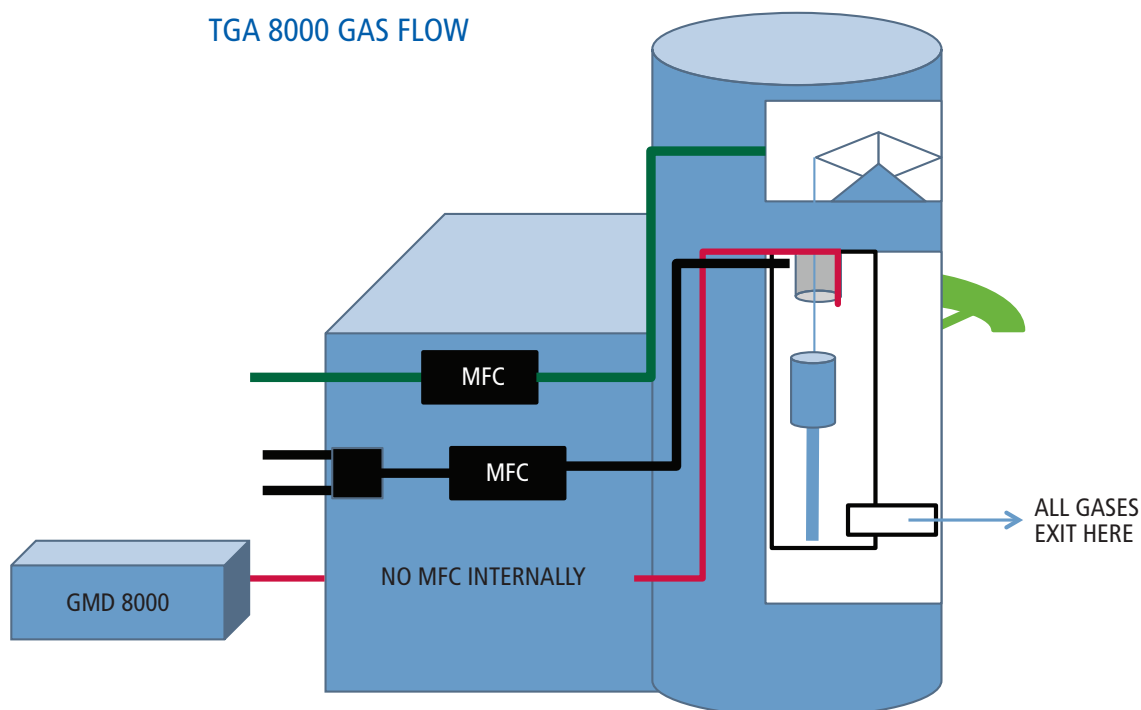
- Decomposition and thermal stability
- Component identification and quantification
- Moisture/solvent evolution and identification
- Reaction kinetics and modeling

## Perfect for unattended operation

In today's budget-constrained lab environments, your entire staff is being asked to perform complex characterizations – so the need for simple, easy-to-use instrumentation has never been greater. Our newly designed 48-position autosampler is simply the best in the business – the perfect system for single sample autoloading or for overnight multiple sample analysis. This patent-pending autosampler works seamlessly with our Accupik accessory used for testing aqueous or volatile samples, as well as with our comprehensive array of hyphenated accessories.



## TGA 8000 GAS FLOW



# IT'S TGA THAT'S BUILT FOR BETTER CONTROL

An optical null ultra-microbalance isolated in a temperature-compensated balance chamber ensures stability and provides the capability of measuring the smallest weight changes.

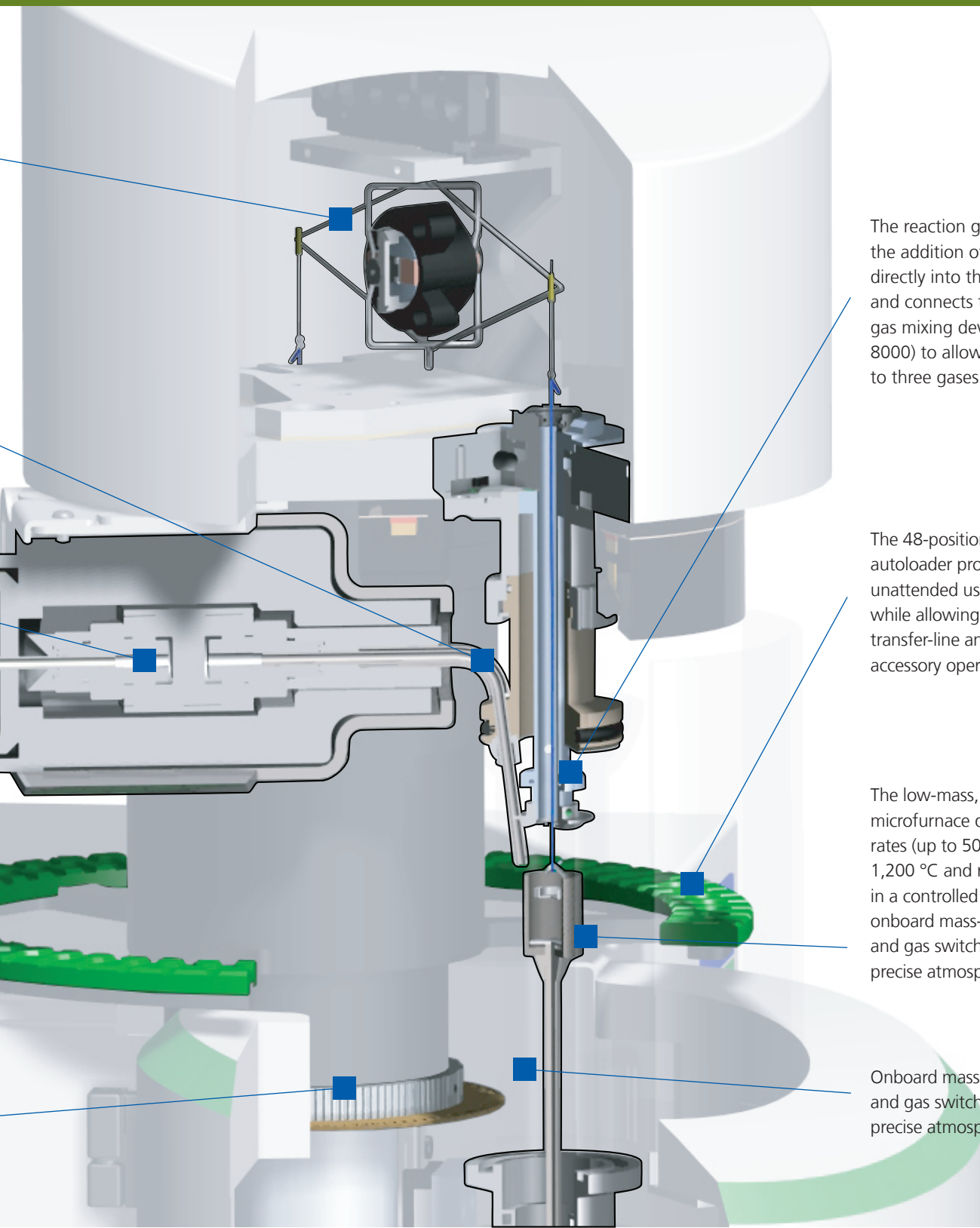
The hot finger keeps the transfer-line sniffer tube at a high temperature to prevent condensation – and the sniffer tube removes easily for cleaning.

The heated gas-divert valve allows non-hyphenated runs without the danger of contaminating the transfer line.

The optional hyphenation interface extends the capabilities of the TGA 8000 system to evolved gas analysis in FT-IR, GC, or GC/MS systems.

Our patent-pending mechanical positioning system tracks the autosampler position even when the system is powered down.





The reaction gas tube allows the addition of a reactive gas directly into the sample area and connects to the optional gas mixing device (GMD 8000) to allow mixing of up to three gases.

The 48-position autosampler/autoloader provides reliable, unattended use of the analyzer while allowing hyphenated transfer-line and Accupik accessory operation.

The low-mass, platinum-wound microfurnace delivers fast heating rates (up to 500 °C/min) up to 1,200 °C and rapid cooling times in a controlled atmosphere, while onboard mass-flow controllers and gas switching allow for precise atmosphere control.

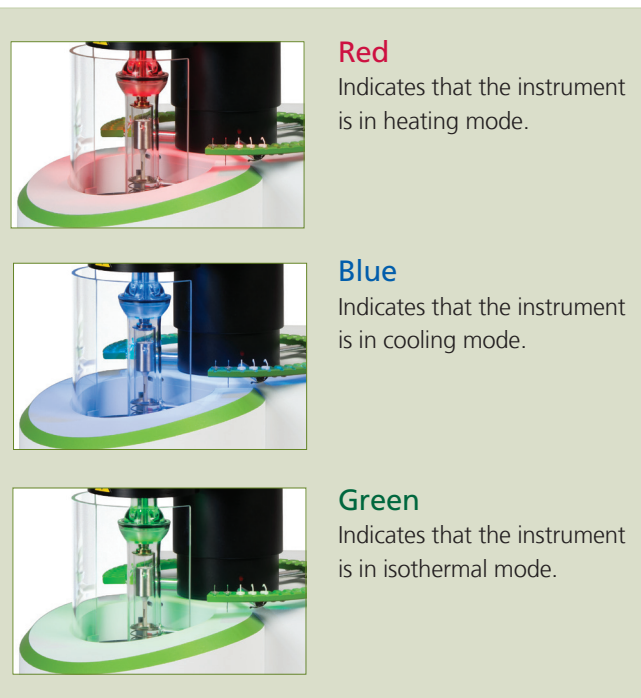
Onboard mass-flow controllers and gas switching provide precise atmosphere control.

## Welcome to the hyphenation evolution

Unlike all other systems, the TGA 8000 is designed from the ground up for hyphenation, enabling you to increase your power of analysis by coupling techniques such as FT-IR, MS, GC/MS, and more. We're the only provider that can supply everything you need to understand and implement a complete hyphenation solution for your lab, including instruments, service, and support. And while other vendors depend on third parties to complete your hyphenation solution, we offer a whole range of hyphenated systems that target your need precisely.

The TGA 8000 system offers simple coupling, a heated gas-divert valve, and a heated sniffer line to maximize operation of a hyphenated system and assure optimum performance. Put that together with the balanced gas flow system in our transfer lines, and you can easily determine the precise makeup of evolved gases.

In fact, our hyphenated TGA-GC/MS system was chosen by the U.S. Environmental Protection Agency for the study of solvents trapped in carbon nanotubes.



Colored illumination provides unique identification of run status.



A powerful iOS application allows TGA control and monitoring with an iPhone® or iPad®.



## The go-to software for all your TGA needs

The TGA 8000 system is operated under Pyris software, the platform of choice for thermal analysis. It's intuitive and user friendly, and it provides a wide range of standard features and capabilities that deliver maximum flexibility across our complete range of thermal analysis systems.

With the Pyris Player feature, you get complete unattended operation of your autosampler and sample analysis – from sample collection to reporting and printing. Pyris Player enables you to group like analyses to simplify setup and sequencing. Plus, our AutoStepwise™ software provides exceptional separation of overlapping events and quantitative compositional analysis – and it can easily separate the various transitions associated with multicomponent materials such as polymer blends, elastomers, and materials containing solvents. And with decomposition kinetics, it enables you to study degradation by traditional kinetic methods.

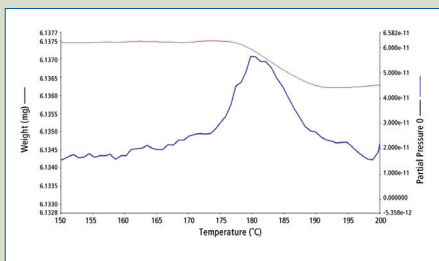
With Pyris software you change furnace position, load or unload a sample, view run status, and even see a graphical view of your experimental data – all at the touch of your finger. Plus, the system delivers all the convenience and monitoring capabilities of Apple® iOS software from your iPhone® and iPad® – enabling convenient local control and status monitoring of your TGA 8000 system.

## Unsurpassed Performance for Complex Characterizations

The next big step in the evolution of thermogravimetric technology, the TGA 8000 delivers the throughput and performance you need in an easy-to-use, easy-to-maintain, automated system – perfect for these applications and more:



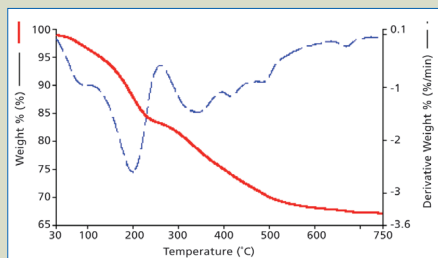
Often it's not enough to know how much solvent comes off during testing – identification of the solvent is essential to complete characterization.



Connecting the TGA 8000 to a PerkinElmer GC/MS or MS system allows quantitation and identification of evolved gases, as in this example for the study of a solvent of recrystallization in a pharmaceutical.



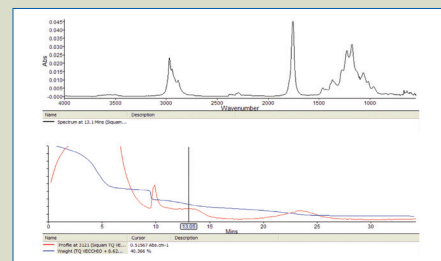
Organic chemical contamination from illegal dumping, leaking tanks, and other sources is a serious concern. TG-IR can help you identify harmful chemicals in our soil.



Weight loss (solid red line) and derivative (broken blue line) for the contaminated soil sample.



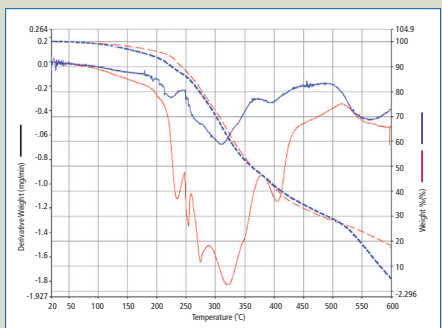
Plasticizers in polymers can be quantitated and identified by connecting the TGA 8000 to a PerkinElmer FT-IR.



In this example, the plasticizer is easily identified by examining the IR spectrum during the weight loss associated with evolution of the plasticizer (at the 13-minute point of the experiment) and comparing it to a reference library.



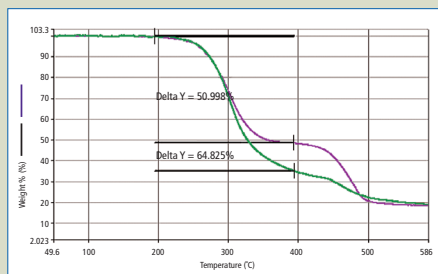
Analysis of complex matrices in coffee beans shows not only differences in beans but also leachables that may be contaminating the packaging.



Resultant thermogram from the analysis of coffee beans. The blue curve is unroasted beans from Africa; the red curve is unroasted beans from Sumatra. The weight loss and the first derivative are shown.



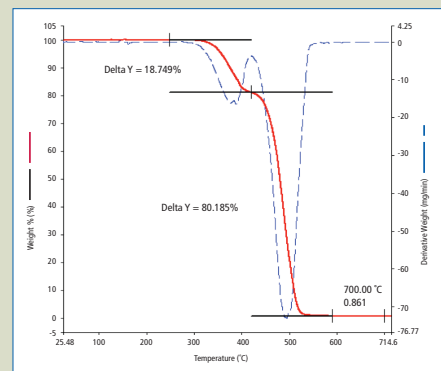
Not all phthalates in PVC are acceptable for all applications, and TGA-MS and TGA-GC/MS can help determine which types of phthalates are present.



TGA percent-weight-loss curve generated from the analysis of two PVC samples: one with DINP (purple), a regulated phthalate and a weight loss (delta y) of 50.998%; and a second with a mixture of nonregulated phthalates (green) and a weight loss (delta y) of 64.825%.



Analysis of ethylene vinyl acetate by TGA-MS enables you to confirm that your products contain the exact material you expect – and have paid for.



TGA curve generated from the analysis of EVA samples.

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