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PYRIS 1 TGA
thermogravimetric analyzer

OPERATION

Instrument Design

The Pyris™ 1 TGA is a vertical design TGA that utilizes a high sensitivity balance and quick response furnace. The balance is located above the furnace and is thermally isolated from the furnace. A precision hangdown wire is suspended from the balance down into the furnace. At the end of the hangdown wire is the sample pan. The sample pan's position in the furnace is extremely reproducible.

Balance

The balance is housed in a thermostatted chamber that isolates the balance from thermal effects. This design enhances sensitivity, accuracy, and weighing precision.

Balance tare: Reproducible to ±2 µg

Balance sensitivity: 0.1 µg

Balance accuracy: Better than 0.02%

Balance weighing precision: 10 ppm (for a 100-mg sample)

Hangdown Wires

Hangdown wires that suspend the sample pan from the balance are made of high temperature quartz, nichrome, or platinum.

Sample Pans

The standard furnace sample pans are made of platinum or ceramic with a capacity of 60 µL .

The high temperature furnace uses sample pans made of platinum or ceramic with a capacity of 250 µL.

Additionally, disposable sample pan liners made of aluminum or stainless steel make cleanup easy.

Standard Furnace

The TGA standard furnace employs a microfurnace that has a low thermal mass for quick cooling and equilibration. The platinum heater element acts as a resistance temperature detector (PRTD) under tight feedback control. Accurate program temperature control reduces overshoot to 0.2°C at 100°C/minute, which results in stepwise analysis precision. The sample temperature is sensed by a chromel-alumel thermocouple.

Standard furnace temperature range: Subambient to 1000°C

Standard furnace scanning rates: 0.1°C/minute to 200°C/minute

Temperature precision: ±2°C

High Temperature Furnace

An optional external furnace is constructed with a platinum/30% rhodium heating element. The sample temperature is sensed by a platinum/10% rhodium-platinum thermocouple.

High temperature furnace temperature range: 50°C to 1500°C

High temperature furnace scanning rates: 0.1°C/minute to 50°C/minute

Temperature precision: ±5°C

Sample Atmosphere

The sample atmosphere may be static or dynamic. Typical gases used are nitrogen, argon, helium, carbon dioxide, air, oxygen, or other inert or reactive gases. Analyses are done at normal pressure or at reduced pressures.

Control

The Pyris 1 TGA operates on Pyris Software for Windows®. This is the most comprehensive thermal analysis software available that offers high quality, reliability, and flexibility for operation, data analysis, and automation. Automation is controlled by Pyris Player, a standard feature of Pyris Software for Windows.

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Mass Spectrometer Coupling

It is possible to determine the reaction products from evolved gases during decomposition by using simultaneous gas analysis. Our TGA is compatible with most mass spectrometers.

FT-IR Coupling

Infrared spectroscopy is a proven gas analysis method especially for polymers. The Pyris 1 TGA can be coupled to most FT-IRs.

Autosampler

The Pyris 1 TGA Autosampler can run up to 20 samples unattended. It has the ability to be customized through Pyris Player to meet your analysis needs and increase productivity.

Gas Switching

Reduced furnace volume allows gas switching to be fast, thorough and efficient. The time to purge the sample area of ambient gases (remove 99% of oxygen) and replace the volume with an inert purge gas is less than 3 minutes. It takes 10 minutes to achieve a 99.99% oxygen-free environment.

Cooling

The furnace is forced air cooled with an external fan and internal booster purge. All purge products are easily directed to the laboratory exhaust vent.

Under normal operation the standard furnace cools down from 1000°C to 40°C in less than 15 minutes. The standard furnace temperature can be continuously monitored regardless of position.

Under normal operation the high temperature furnace cools down from 1500°C to 100°C in less than 30 minutes.

Bench Dimensions

Height: 67 cm
Width: 28 cm
Depth: 60 cm

Power Requirements

100 to 240 volts
50 or 60 Hz
10 amps max

Ordering Information:

PE Part Number	Description
N537-0742	Pyris 1 TGA with standard furnace
N537-0744	Pyris 1 TGA with standard furnace and autosampler
N537-0743	Pyris 1 TGA with high temperature furnace

For additional information about the Pyris 1 TGA, see Product Note D-5992.



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