

With an enclosed ion source and a triple-filter quadrupole, the flexible Thermo Scientific ProLab benchtop mass spectrometer is a proven laboratory workhorse. The spectrometer's wide dynamic range combined with our powerful Thermo Scientific GasWorks software create an ideal analytical tool for rapid measurement of gas and vapor concentrations.

Thermo Scientific ProLab Benchtop Gas Analysis Mass Spectrometer



Applications

- Catalysis research
- Thermal analysis
- Semiconductor PFC monitoring
- Gas purity measurements
- Pilot plant gas analysis
- Transient kinetic studies
- Temperature Programmed Desorption (TPD)
- Evolved gas analysis
- Air separation plant troubleshooting

Reliable & Compact

The Thermo Scientific ProLab benchtop mass spectrometer delivers reliable, cost-effective analytical performance and offers one of the smallest footprints for an instrument in its class. Able to heat the completely inert sample inlet to +120°C (+248°F), it achieves fast measurement of even condensable gases. The enclosed ion source along with the triple filter ensure a wide dynamic range.

Application-Specific Models

The ProLab benchtop mass spectrometer meets a wide variety of gas analysis applications via two optimized configurations.

- The standard ProLab benchtop mass spectrometer enables cost-effective performance for demanding applications such as fast atmospheric pressure sampling for catalysis, thermal analysis, and evolved gas studies. This model can be applied to many atmospheric gas sampling applications.

- The UHP ProLab benchtop mass spectrometer is for demanding trace impurity analysis applications. With a fully bakeable, all-metal combination capillary inlet, this model is capable of a 100% to 50 parts per billion (ppb) measurement range.

Easy to Setup & Service

Two easy-to-change thoriated filaments extend instrument uptime and minimize servicing time while the self-aligning source assembly expedites setup and facilitates service. Thermo Scientific GasWorks software also expedites setup and is available in a range of languages to fulfill international requirements. In addition, a standard 12-month comprehensive warranty and ongoing service and support enable maximum instrument optimization.

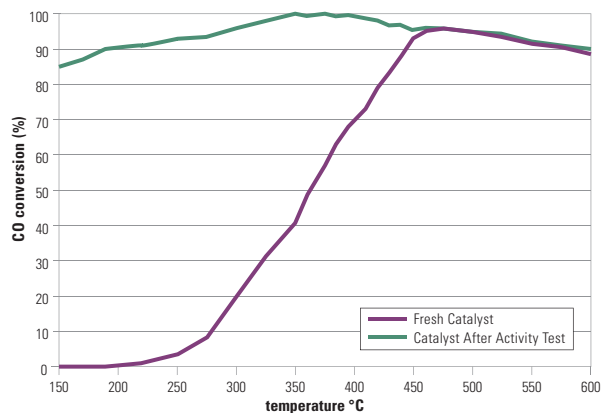
Application: Catalysis Research

Using the fast online measurement capabilities of the ProLab benchtop mass spectrometer, the active sites and conversion rates can be studied to understand and develop modern catalysts.

Applications include:

- Isotopic transient kinetics
- Non-steady state
- Oxygen storage
- Temperature Programmed Desorption (TPD).

CO conversion over fresh and reduced Pt/CeO₂

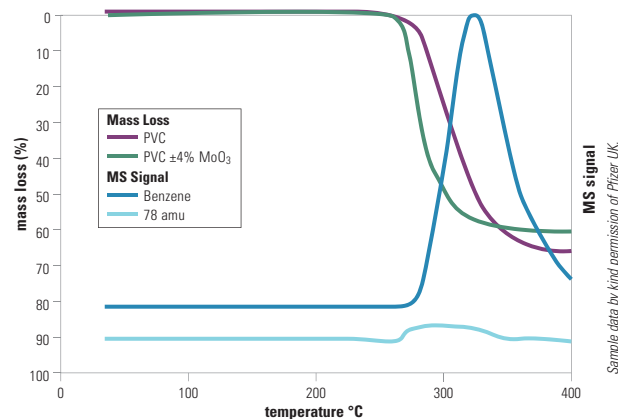


Application: Thermal Analysis (evolved gas analysis)

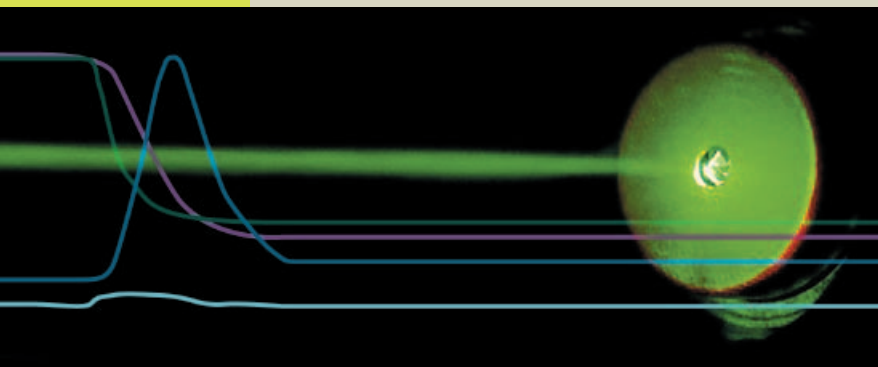
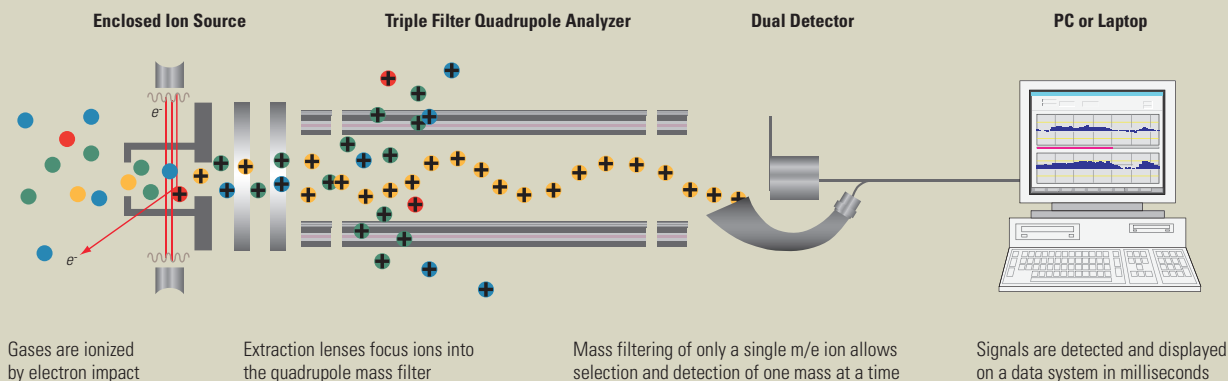
When high sensitivity is needed to give insight into decomposition chemistry, the ProLab benchtop mass spectrometer's Thermal Analysis-Mass Spectrometry combination provides all the performance required for materials characterization by evolved gas analysis. Applications include:

- Polymers
- Pharmaceuticals
- Natural products
- Inorganic compounds.

TG and EGA data in a fire retardant experiment



Cross Section of Quadrupole Gas Analyzer





Features & Benefits

- Enclosed ion source results in high sensitivity, low backgrounds, better stability and a longer source lifetime
- Detachable ion source allows for easy cleaning and filament change
- Triple filter option ensures contamination resistance and precision
- Completely inert sample inlet can be heated to +120°C (+248°F) for measurement of condensable gases
- Powerful Thermo Scientific GasWorks software provides qualitative and optional quantitative determinations, including full-matrix inversion analysis
- Small footprint, benchtop system saves valuable floor and bench space
- Under-mount multi-stream inlet available
- Multi-level security and user configurable alarms
- User installable, no specialist knowledge or tools required, instant analysis

Tailored Sample Introduction Systems

To fulfill the need for analysis of multiple samples with rapid sample throughput, the ProLab benchtop mass spectrometer's inlet options cover atmospheric and low vacuum sampling devices as well as corrosive and condensable gases.

- The standard capillary inlet and bypass for atmospheric pressure sampling offers durability and rapid response (~500 msec). The direct coupling of the inlet to the source ensures accurate sample transport and no mass fractionation effects.
- The leak valve inlet is for variable sampling pressures from 10 bar to 10⁻³ mbar.
- The thermal analysis capillary inlet and bypass for atmospheric pressure sampling offers a ceramic probe for connection to thermobalances, etc.
- The UHP, all-metal atmospheric inlet for atmospheric sampling of UHP gases is available with a temperature controlled heating option.
- The multi-way sample inlet with a direct connection to the ProLab benchtop mass spectrometer via capillary is suitable for six sample lines and six calibration lines, all controlled by GasWorks software.
- The dimethyl silicone membrane inlet gives enhanced VOC sensitivity, typically from 5 ppb to 1000 ppm.

Thermo Scientific GasWorks Software

Easy-to-use for leak checking yet flexible enough for more advanced analytical work, Thermo Scientific GasWorks software provides unrivalled analysis, accuracy and repeatability. Combining click-on icons and pull-down menu options, it encompasses all of the analytical measurement modes required for routine or research analyses, including analog scans and multi-decade histogram scans. Changes to the setup or display can be made in mid-analysis without interrupting data collection, storage or critical alarm settings.

For sample identification, the extensive library enables an unlimited number of compounds to be added. The database can be searched by mass or compound groups or by automatic library search by comparison. Stored histograms may be read into the optional NIST database that contains 75,000 cracking patterns. For quantitative analysis, GasWorks offers the powerful option of a complete process quantitation package, allowing full matrix inversion algorithms, "click on" selection of measured peaks from the matrix table, and direct reading of data in ppm or percent.

- Simple, intuitive setup of measurement methods via a clear, easy-to-view graphical user interface
- Multi-measurement modes: selective ion scans, spectral scans, and qualitative and quantitative analysis
- Instrument and measurement status permanently displayed and instantly updated
- Multi-level user configurable password security system
- Comprehensive data analysis and reporting
- Modem support enabling remote fault location, tuning, calibration and online application support.



Commitment to Service

Our fully-trained, highly qualified engineers and applications personnel provide global support across a range of technologically-advanced products and services. Optimize your instruments, achieve greater process control and leverage your investment by administering:

- First class training programs, tailored to your company's needs
- Implementation of quality systems
- Flexible maintenance contracts
- A comprehensive range of spare parts
- Technical and applications support
- Modern support for extensive online diagnostics, remote fault finding and performance analysis.

Thermo Scientific ProLab Benchtop Mass Spectrometer

General Specifications

Mass Range	1-300 amu
Ion Source	Enclosed
Mass Filter	Triple filter assembly [127 mm (5 in) main filter and 25 mm (1 in) pre and post filters]
Detector	Dual detector (Faraday/Channeltron® multiplier)
Resolution	1 amu at better than 10% valley for adjacent peaks (as per the AVS standard)
Dynamic Range	7 decades (Faraday); 8 decades (Channeltron)
Minimum Detectable	<10 ppm (Faraday); <50 ppb (Channeltron with UHP inlet for non-overlapping peaks)
Pumping	Differential pumping with drag stage turbo pump and rotary backing pump
Inlet	Heated capillary inlet with bypass (options available)
Bakeout	To +120°C (+248°F) with a hot running mode of +80°C (+176°F)
Electronics Engine	Smart IQ+
Gauges	Bakeable cold-cathode gauge
Filaments	Two thoriated iridium filaments for high sensitivity with low backgrounds

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