

VARIAN, INC.

490-GC

THE "MEASURE ANYWHERE" MICRO-GC



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www.varianinc.com



Agilent Technologies

VARIAN, INC.

Precise Gas Analysis for Production & Research

"Measure Anywhere" Micro-GC

The 490-GC Micro-GC is a rugged, compact, laboratory quality gas analysis platform that always delivers the information you need, wherever you need it. When the composition of gas mixtures is critical, this fifth generation micro-gas chromatograph generates more data in less time for faster, and better, business decisions.

The 490-GC is designed to provide maximum flexibility and ease-of-use for engineers and analysts in a variety of industries. With the 490-GC you benefit from customization utilizing a full palette of options, including optimized sample conditioning to achieve greater sensitivity, performance and practicality. With available autonomous operation, operators can generate measurement results without special training or skills.

- Unparalleled configuration flexibility uses up to four separate GC channels individually or together for completely self-contained operation
- Very fast answers with separations in seconds achieved through the use of narrow-bore capillary, PLOT and micro-packed columns
- Quick and easy start-up delivers results in minutes, making it practical and efficient if you need to change measurement locations frequently
- High performance laboratory quality results improve confidence in your decision making
- Very compact dimensions, with a footprint smaller than the area of this page, open up myriad measurement possibilities, in the laboratory, in the field, on the road and in process
- Convenient array of cabinets and housing types, including 1 or 2 channel, 3 or 4 channel "bench", 19 in. rack mount and fully self-contained/portable, for maximum flexibility
- Galaxie™ Chromatography Software from Varian for comprehensive system control, data acquisition and report generation
- Extensive remote control and I/O capability to facilitate seamless integration and utilization within your existing enterprise operations



The new "Measure Anywhere" 490-GC Micro-GC from Varian

Modular and flexible

The 490-GC is pre-configured/tested at the factory for your analysis and arrives ready to go. If required, the system can be reconfigured in the field for new applications in only a few minutes with user-installable plug and play GC channels. Every channel is essentially a complete, miniaturized GC with electronic gas control, injector, narrow-bore column and detector, for fast, high efficiency separations. Each is independently controlled, including injection volume, column oven temperature and carrier gas. With micro-electronic gas control and time-programmable back-flush, you can analyze sample components of interest while eliminating those that aren't. Back-flush capability prevents less volatile components and other undesired contaminants such as moisture from reaching the column.

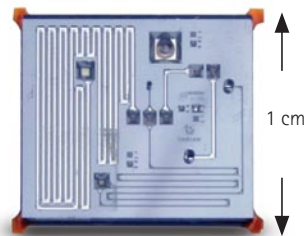
The Speed You Need

Micro-machined technology for very fast results

The faster separations made possible by narrow-bore capillary GC columns are fully exploited when all components in the system with which the sample comes into contact are miniaturized. The micro-machined injector and thermal conductivity detector (μ -TCD) together with a narrow-bore column, deliver extremely rapid separations of gases in a matter of seconds

Micro-machined injector

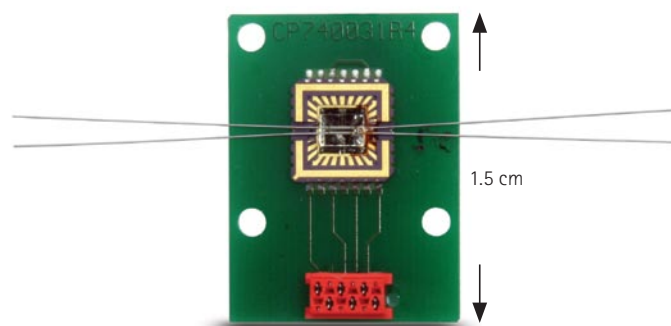
- Silicon micro-machined injector has no moving parts for high dependability
- Software-selectable injection volumes from 1 μ L to 10 μ L cover a wide range of applications requirements
- Available back-flush capability protects the analytical column from excessive wear and tear
- Injector can be heated to 110 $^{\circ}$ C which eliminates discrimination of higher hydrocarbons for improved performance



Micro-machined injector.

Micro-machined Thermal Conductivity Detector (μ -TCD)

- 200 nL internal volume eliminates peak broadening providing better data quality
- Detection limit is 1 ppm for capillary columns and 10 ppm for "micro-packed" columns (component dependent)



Micro-machined thermal conductivity detector.

VARIAN, INC.

A Micro-GC For Any Application

Micro-machined Differential Mobility Detector (μ -DMD)

The 490-GC may be equipped with a μ -DMD to provide enhanced sensitivity and tunable selectivity. The μ -DMD is fully integrated into the 490-GC. The 490-GC uses dual detection technology in which the μ -TCD and μ -DMD are connected in series. Galaxie™ Chromatography Software processes signals from both detectors, providing selective/trace information (DMD) and matrix information (μ -TCD) in a single analysis. The DMD enables the 490-GC to analyze multiple target components at trace levels with no pre-concentration required. This unique selectivity makes trace analysis possible even when the components of interest co-elute with bulk components.

Gas analysis in the field

The diminutive size and weight of the 490-GC make it extremely practical to carry between analysis sites in the field, such as perimeter monitoring, multiple drilling locations, and at natural gas pipelines and metering stations. This is particularly important if sample integrity could be compromised in transit to a central analytical laboratory. A self-contained, portable version is available if there is carrier gas or power is available at the measurement location. Built-in gas cylinders and a rechargeable battery provide up to eight hours of productive field time. Instrument control, data analysis, and diagnostic testing can be conducted at the instrument or remotely via the Internet.



Varian 490-GC with integrated DMD.



The Micro-GC in its fully self-contained field case offers "on the go" measurement convenience.

Process Monitoring & Control Capabilities

490-GC PRO for fast, reliable and fully unattended operation

Designed to be a "system" component, the 490-GC PRO does not require an external computer to generate data/results. Rather, it features onboard data collection and integration, and result generation. User-defined information is then automatically passed on to an external system (ex. process control) in a completely unattended manner. No local operator is required.

For added convenience for on-line/at-line analysis, the 490-GC PRO is also available in a 19 in. rack mounted chassis. Sampling and sample conditioning devices, such as stream selection valves and Genie® membrane filters, can be mounted within the housing. The 490-GC does not use flammable gases, and requires only small quantities of inert sample gas for analysis and monitoring, making it the preferred choice for use in environments where operational safety is of paramount importance.

The 490-GC PRO is initially set up via an external computer using PROStation software. The analysis method is quickly established/optimized and calibration runs conducted and validated. The computer is then disconnected and the on-board data handling system takes over complete operation of the 490-GC PRO. Measurements are generated according to the onboard method protocol or at the behest of an external system. The system is designed for continuous operation, automatically transferring raw or processed results to an external system (typically a process control computer) via one of a variety of industry-standard communication protocols, including ModBus, RS-485, TCP/IP, RS-232, and FTP/Webserver.



The 490-GC PRO for quick and accurate, around the clock, monitoring and control.



490-GC Micro-GC 19" rack-mounted version.

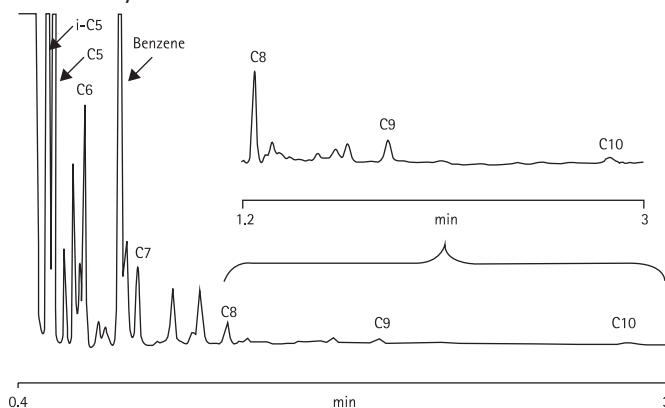
Accurate Measurements & Analyses

Key applications

The 490-GC provides gas analysis in seconds for production and research, in any case where precise gas analysis saves money and adds value. Examples:

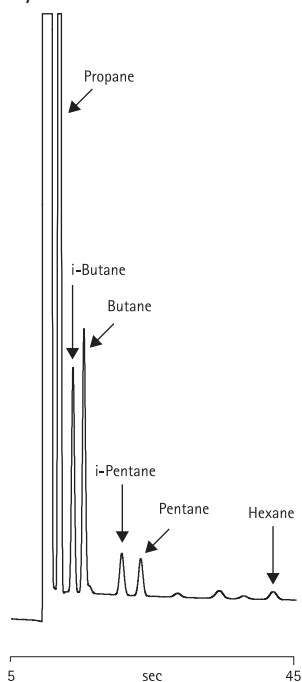
- Natural gas/calorific value determination
- Analysis of simple to complex refinery gases
- Oil/gas exploration, mud-logging
- Analysis and quality control of specialty gases
- Biogas
- Assessing efficiency of catalysts, fuel cell stacks
- Air monitoring

Extended Hydrocarbons



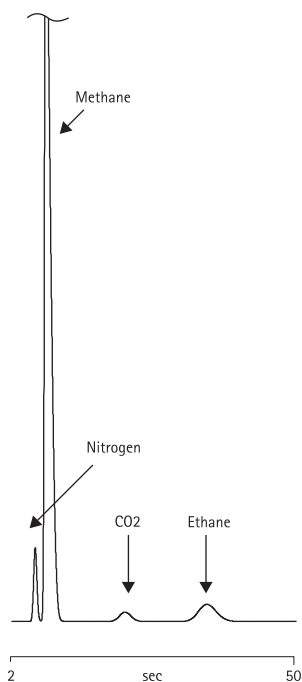
The analysis of extended hydrocarbons in natural gas.

Hydrocarbons



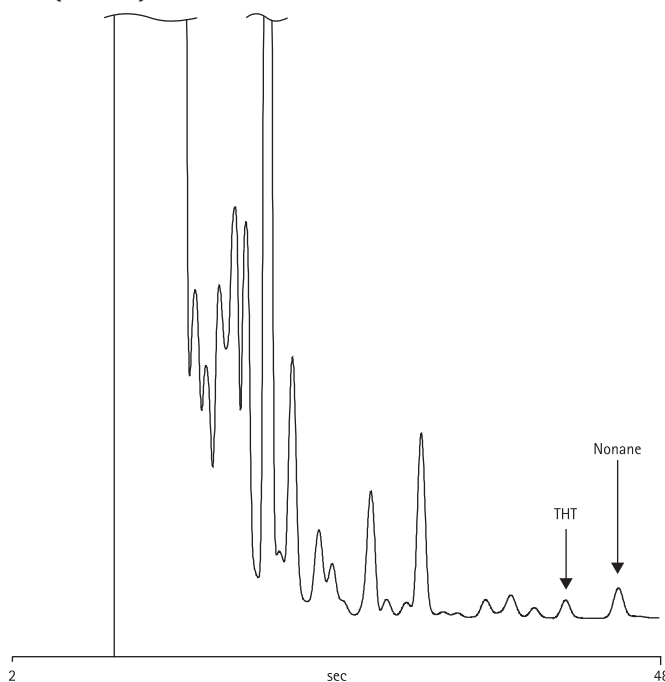
The analysis of hydrocarbons in natural gas.

Permanent Gases



The analysis of permanent gases in natural gas.

THT (odorant)



The analysis of THT (odorant) in natural gas.

Meeting Your Analytical Needs

Accessories

Micro-Gasifier

The Micro-Gasifier provides controlled LPG (Liquid Petroleum Gas) and LNG (Liquefied Natural Gas) sample evaporation before the sample is introduced into the gas chromatographic injector for analysis. In addition, high pressure gas samples can be reduced without creating cold spots, preventing discrimination in the sample.



Externally-mounted Gasifier.

The Micro-GC accessory bracket

The Micro-GC accessory bracket is an on-board universal mounting platform for accessories and will take one channel position in the Micro-GC. With the accessory bracket, stream selection valves, Micro-Gasifier, Genie® membrane filters, pressure regulator, sample pressure sensors and sample relief valves can be integrated.



Integrated Sample conditioning in the 490-GC.

Syringe injection

The gas sample can be injected with a syringe in the Micro-GC via the optional inlet on the front of the instrument. The sample can be introduced via a septum cap or by using a Luer-lock connection.



Syringe injection optional.

Genie Membrane Filter

The Genie membrane filter will remove particles and liquids from your gas sample. The filter is suitable for ppb up to percentage level analysis, is fully inert, and is compliant for caloric value determination methods.

Even More GC Solutions from Varian

The Varian 400-GC series is a family of high performance gas chromatographs and application-specific analysis solutions that offers faster separations and increased confidence in results for the broadest range of GC analyses.

Varian, Inc. is also one of the leading suppliers of GC/MS - providing ion trap mass spectrometers and quadrupole mass spectrometers coupled with Varian 450-GC or 431-GC gas chromatographs.

Galaxie™ Chromatography Software is a scalable software solution that manages all your chromatography data. Whether in standalone or client/server mode, Galaxie software provides all the data handling and instrument control functions necessary for the modern chromatography laboratory, no matter how large or small

Varian offers the highest quality, most reproducible GC capillary columns with the most demanding quality assurance specifications in the industry. We control the entire process in-house, from design and production of the tubing and stationary phases, to column manufacture, testing and dispatch.

Ensuring clean gas delivery is essential for accurate gas chromatography. Varian's Gas Clean™ Filters provide leak-free filter replacement that reduces downtime. They are very economical, with immediate payback, and the highly sensitive filter indicators provide maximum instrument protection.



Varian manufactures a comprehensive range of all the GC consumables you need.

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490-GC

THE "MEASURE ANYWHERE" MICRO-GC

Varian offers robust instrumentation, application-based consumables, and customer-focused services, backed by our global team of product and applications experts, ready to help you solve your analytical challenges. Whether you're monitoring impurities in drinking water, designing new therapeutic drugs, or developing cleaner fuels, our solutions deliver the sensitivity, flexibility and productivity your laboratory requires.



Varian Care Program

Our goal is to help you increase your productivity, maximize your uptime and achieve the highest return possible on your investment. Our experienced and highly-qualified support organization is strategically located throughout the world to ensure rapid response.

Be confident knowing that your instrument will deliver maximum performance, your users are fully trained and expert technicians will respond quickly to your support needs — because Varian cares.

Shop Online

Varian offers the added convenience of purchasing products online. The products you need are just a few clicks away at www.varianinc.com

We are committed to meeting your needs with a full range of consumable products and supplies. Call today to request your free copy of our comprehensive analytical supplies catalog or download it from our web site.

Varian, Inc.

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