

HUMAN HEALTH

ENVIRONMENTAL HEALTH



# NATURALLY BETTER

CHROMATOGRAPHY  
SOLUTIONS



## Clarus Gas Chromatographs

Clarus 680/580/480



CLARUS DELIVERS  
POWER AND PERFORMANCE  
AT EVERY LEVEL



## The Clarus GC Family – Performance you can rely on from the leader in Gas Chromatography and sample-handling solutions

With more than 50 years' experience in Gas Chromatography (GC), the PerkinElmer® family of Clarus® GC instruments can be depended upon to meet the most demanding performance and throughput needs for today's analytical, process monitoring and quality control facilities.

As the cornerstone of a commanding and diverse portfolio of Chromatography solutions, the Clarus GC family provides a solid analytical foundation for laboratories that require effective solutions to applications in the environmental, food and beverage, forensics, petrochemical, materials testing, and academic markets.

Our flexible Clarus GC offerings are loaded with innovative features that make them a pleasure to use. Each instrument has been designed to meet the analytical needs, experience level, and productivity demands of the user.

**Clarus 680 GC.** Designed for fast-paced, high-volume laboratories that need to speed up analytical cycle times. It maximizes throughput with the fastest injection-to-injection time of any conventional Gas Chromatograph.

**Clarus 580 GC.** Meets the needs of facilities that require a rugged, high-quality instrument that provides accurate and efficient performance day after day, while being extremely user-friendly.

**Clarus 480 GC.** Developed in response to the strong demand for reliable, world-class GC technology in budget-conscious laboratories. Meets diverse application requirements without sacrificing performance.

To enhance the flexibility and performance of our Clarus Gas Chromatographs, we offer a broad range of advanced devices and innovative technologies, including sample handling systems, multiple detectors, intuitive interfaces, data management software, and a full complement of accessories and consumables. As a single source for all your GC needs, PerkinElmer enables you to easily create a completely integrated analytical solution that meets your specific application challenges.



The Clarus SQ 8 GC/MS system.



## CLARUS 680 GAS CHROMATOGRAPH



# THE FASTEST INJECTION-TO-INJECTION TIME DELIVERS GREATER ROI

Every fast-paced, high-volume laboratory shares a common goal: to speed up analytical cycle times. PerkinElmer's latest innovative solution? The high-performance Clarus 680 Gas Chromatograph.

**Powered by the fastest available heat-up and cool-down conventional oven and programmable injectors.**

PerkinElmer has always led the way with innovations in Gas Chromatography and the Clarus 680 Gas Chromatograph is no exception. It features a unique, high-performance oven with the fastest combined heat-up and cool-down rate in a conventional GC available today together with enhanced temperature-

programmable injectors. Even when running the most challenging applications, the shorter injection-to-injection time will significantly increase throughput and productivity by reducing analytical cycle time, and bring a faster return on investment (ROI).

The Clarus 680 GC incorporates many other PerkinElmer innovations that provide unprecedented operational simplicity and outstanding flexibility while removing the barriers to productivity that can arise with more demanding samples and applications. The fastest temperature-programmable inlets available combined with programmable pneumatic control (PPC) provide simple and straightforward solutions to complex analyses such as analysis for methanol in crude oil or determination of pesticides in food.

For data acquisition, review and reporting, PerkinElmer's award-winning TotalChrom® Chromatography Data Systems (CDS) make your job easier than ever. Software drivers are also available to control the Clarus GC family for labs utilizing Waters® Empower™ 2 and Agilent® EZChrom Elite™ data systems.

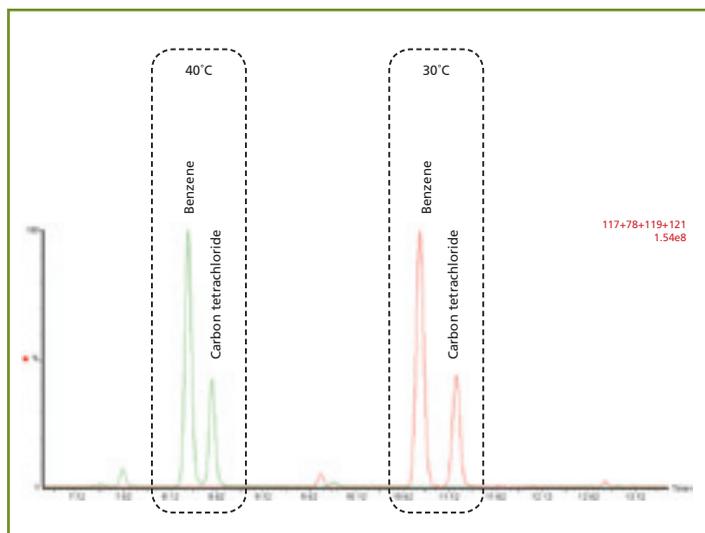
Plus, our instruments feature an intuitive touch-screen interface with real-time signal display and eight-language support for greatly simplified user interaction.

## The Clarus 680 GC maximizes your GC productivity

### Patented high-performance oven

The unique oven design of the Clarus 680 GC provides the fastest available heat-up and cool-down rate, enabling shorter injection-to-injection and analytical cycle times, maximizing your sample throughput.

- **Its twin-walled oven design with concentric air exhaust\*** allows the user to achieve great separation at near-ambient temperatures without the use of special coolants, especially important for the analysis of Volatile Organic Compounds.
- **Fast oven heat-up rates** allow faster chromatography, particularly useful when speeding up the elution of late-eluting compounds.
- **Fastest available cool-down rate** is delivered using forced convection air. This greatly reduces non-productive time between runs.
- **Universal Programmable Split-Splitless (PSS) and Programmable On-Column (POC) injectors design** enable Large Volume Injection of volatile solvents and cold on-column injections without the use of expensive cooling agents.
- **Best-in-class 108-vial integrated liquid autosampler** increases the flexibility and automation of Clarus GC systems. Unobstructed access to both injection ports permits any combination of analyses for the most efficient utilization of the Gas Chromatograph. Fully controllable via the GC control system or the software. Optical sensor monitoring ensures proper system performance at all times, and optimized injection point for a better repeatability.
- **Inert capillary injectors and detectors** enable the most demanding applications again and again. They ensure that problematic samples like sulfur-containing compounds or nitro phenols can be analyzed while minimizing the need for recurring maintenance.
- **Autosampler pre-rinse performs time-consuming syringe washes** before the GC becomes ready, saving time in between runs and reducing injection-to-injection time.



Clarus 680 GC near ambient separation: benzene and carbon tetrachloride separation improves when the oven starts at 30 °C, achieving full baseline resolution.

## Improved convenience and performance with programmable pneumatic control (PPC) for injectors and detectors

Using PPC carrier-gas, flows are automatically adjusted to compensate for variations of ambient temperature and pressure, providing constant retention times reproducibility under widely varying conditions. This greatly enhances system stability even with extreme changes in lab temperature or weather conditions.

### Swafer micro-channel technology — expanding the capabilities of capillary Gas Chromatography

New Swafer™ micro-channel flow technology is an innovative and user-friendly approach to automate flow-switching applications. From simple techniques like switching between liquid and headspace injections or connecting two detectors to a single column, to sophisticated multidimensional separations on complex samples, the Swafer technology can enhance productivity in most analytical labs.

#### Swafer key points

- Complete independence of the column from injectors or detectors.
- Allows tackling difficult separations, delivering richer information.
- Easy setup configuration change, without requiring service information.



#### QUICK GLANCE

- Oven cool-down from 450 °C to 50 °C in *less than 2 minutes*.
- Unique high-performance conventional oven and injectors *speed cycle times*.
- Integrated autosampler adds *flexibility* and *automation*.
- Temperature-programmable inlets deliver *performance* and *flexibility* for more demanding applications.
- Programmable pneumatic control (PPC) adds *automation*.
- PerkinElmer's complete offering allows *easy integration* of best-in-class headspace, headspace trap or thermal desorption as well as MS detection.
- Swafer micro-channel technology *expands analytical capabilities*.
- Innovative, intuitive touch-screen interface makes *operation easy*.
- Scalable TotalChrom Chromatography Data Systems (CDS) make data management and reporting *easier than ever*.
- Complete instrument control through Waters® Empower™ 2 and Agilent® EZChrom Elite™ drivers.

\* patent pending



## CLARUS 580 GAS CHROMATOGRAPH



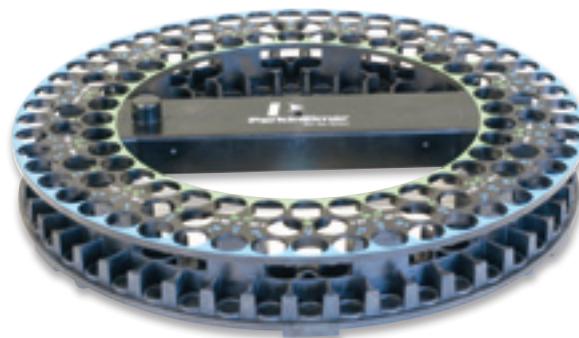
# REDEFINES EASE OF USE FOR EVERYDAY APPLICATIONS

The PerkinElmer Clarus 580 Gas Chromatograph is a fully automated system offering all the advanced capabilities required for laboratories performing large numbers of routine analyses as well as those involved in research and development.

The sleek Clarus 580 GC system offers a whole new approach to the way you interact with your GC instrument. An intuitive full-color touch-screen interface features real-time signal display and eight-language support (English, Spanish, French, Italian, German, Russian, Japanese, Chinese) allowing users to feel more comfortable working with the GC, reducing the learning curve and speeding routine interaction.

Additional unique features like the new 108-vial positions integrated autosampler, Swafer™ micro-channel technology, and easy serviceability enable the Clarus 580 to deliver enhanced GC productivity. Available in hundreds of configurations ranging from easy-to-use, flexible analyzers to dedicated, turnkey systems for petrochemical and air analysis, the Clarus 580 GC is extremely versatile.

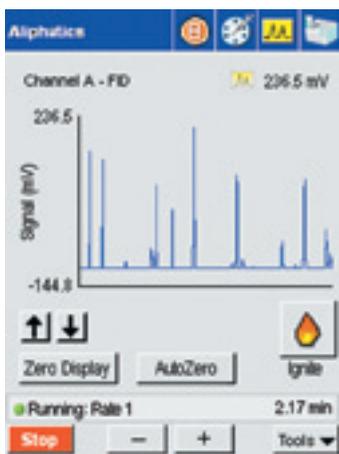
The PerkinElmer TurboMatrix™ Headspace and Thermal Desorption sample-handling devices can be integrated with the GC, providing solutions for applications such as beverage analysis, ambient air testing, environmental work and more.



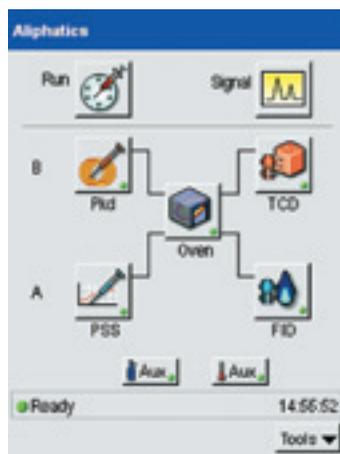
### Innovative touch-screen makes operation simple

PerkinElmer is the first to offer Gas Chromatographs with a large, full-color touch-screen interface, providing easier system accessibility and usability. The Clarus 580 GC signal screen displays a real-time Chromatogram, allowing you to monitor the current state of the system at a glance. The signal monitors both channels simultaneously and can be viewed at the press of a button, providing immediate access to key information.

With single-touch access to the functions you need, the Clarus 580 GC touch-screen eliminates drilldown, simplifying instrument control for novices and experienced users alike. The status screen presents a comprehensive overview of the system. Easy-to-understand icon buttons define the type and status of each heated zone and identify each injector and detector.



Real-time Chromatogram is displayed continuously, allowing you to monitor your runs.

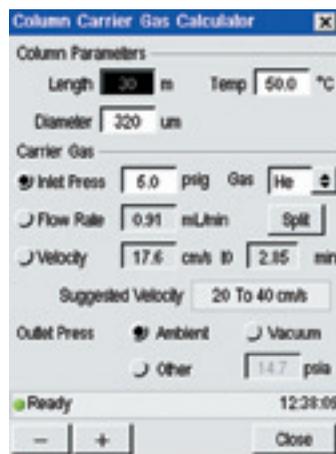


The status screen displays the type and status of each zone.

### Easy setup/method development

The touch-screen interface makes method development easy by providing immediate access to all method parameters in any order, eliminating the need for linear entry of analytical conditions.

Our exclusive, integrated flow calculator allows optimized adjustment of carrier-gas conditions without a separate software program. Simply pick the variable level you want to achieve and the system will automatically determine the correct conditions for your analysis. And the touch-screen interface keeps track of the number of injections, automatically notifying you when to replace septa and perform routine maintenance.



The exclusive PerkinElmer built-in flow calculator determines flow rate at a given column length and diameter.



The injection countdown ensures high precision for manual sample injections.

## Turnkey Solutions and Custom Analyzers to Meet Your Needs

For today's laboratories, meeting the demands of changing regulations and complex testing procedures can be a challenge. The measurement of light gases, volatile and semi-volatile components can be easily accomplished with turnkey systems designed and proven for official method.

That is why PerkinElmer provides over 100 pre-configured analyzers and turnkey solutions that are based upon the Clarus 580 and 680 Gas Chromatographs including light gases, natural and refinery gas analyzers, transformer oil and trace sulfur analyzers, simulated distillation and detailed hydrocarbon analyzers.

All of the analyzers' operation parameters are set and tested at PerkinElmer. Once the GC has been installed, you'll begin processing your samples immediately.

And if PerkinElmer does not have a standard solution to meet your needs, we can configure an analyzer to match your requirements. Your local PerkinElmer representative will work with you to identify your needs and provide the best technical solution.

### QUICK GLANCE

- Robust, proven design provides reliable performance year after year.
- Intuitive touch-screen is easy to use.
- Dual-channel, real-time signal display on the touch-screen.
- Flexible configurations with integrated headspace or thermal desorption, mass spectrometer or Swafer.
- Multiple language support simplifies interaction and raises staff comfort level.
- The Clarus 580 GC is the platform of several turnkey solutions for the petrochemical industry (Refinery and Natural Gas analyzers), alternative energies (Biodiesel), environmental and forensic applications.
- Scalable TotalChrom® Chromatography Data Systems (CDS) make data management and reporting easier than ever.
- Access to worldwide PerkinElmer service and support team.
- Complete instrument control through Waters® Empower™ 2 and Agilent® EZChrom Elite™ drivers.



## CLARUS 480 GAS CHROMATOGRAPH



# BUILT TO PERFORM – AFFORDABLE TO OWN – WITH THE FLEXIBILITY YOU NEED

The Clarus 480 Gas Chromatograph (GC) delivers the proven performance and analytical capabilities of the world-class Clarus GC family at an affordable price for the budget-conscious laboratory. It provides the flexibility to meet a diversity of analytical requirements and delivers the accuracy and precision essential for both non-routine as well as quality control (QC) analyses.

**The Clarus 480 GC feature-set allows a wide range of application flexibility with no compromises in performance.**

The Clarus 480 GC has been designed for ease of setup and operation. As such, tools including an installation kit and localized user guides are available to get your lab up and running quickly and efficiently. A keypad user interface in your choice of five languages (English, Spanish, Brazilian Portuguese, Chinese and Russian) simplifies operator interaction.

The Clarus 480 GC can also be integrated with the PerkinElmer® TurboMatrix™ Headspace and Thermal Desorption sample-handling systems, extending application capabilities.



Choice of local-language keypad interfaces simplifies operation.

### Single-channel or dual-channel configurations provide optimal analytical capability

The Clarus 480 GC is available in single-channel or dual-channel configurations with a choice of a capillary (split/splitless) injector and a packed column injector as well as a selection of four detectors. Manual pneumatics are used to control pressure and flow.

You can choose from any one or two of the following detectors to accommodate a wide variety of analytical applications:



Single- or dual- channel configurations optimize analytical capability.

- Flame Ionization Detector (FID) – offers a wide response range to a broad variety of compounds.
- Thermal Conductivity Detector (TCD) – ideal for light hydrocarbon and permanent gas analysis.
- Electron Capture Detector (ECD) – the premier detector in environmental applications for PCBs, organochlorine pesticides and halogenated hydrocarbons.
- Nitrogen Phosphorus Detector (NPD) – specific for the analysis of nitrogen and phosphorus pesticides in food safety and environmental monitoring.

Adding PerkinElmer's optional best-in-class autosampler with 108 vial positions will enhance the system's flexibility and sample throughput. This integrated liquid autosampler – fully controllable from the Clarus 480 GC keypad – allows injection through either of the injection ports automatically without further user intervention, saving you time and money.

#### QUICK GLANCE

- Single- or dual-channel configurations available.
- Optional liquid autosampler with 108 vial positions.
- Robust, proven design provides reliable performance through manual pneumatics for injectors and detectors.
- Flexible configurations with integrated headspace or thermal desorption.
- Multiple language support simplifies interaction and raises staff comfort level.
- Scalable TotalChrom Chromatography Data Systems (CDS) make data management and reporting *easier than ever*.
- Complete instrument control through Waters® Empower™ 2 and Agilent® EZChrom Elite™ drivers.
- Access to worldwide PerkinElmer service and support team.

## Combine a Clarus Gas Chromatograph with our range of sophisticated tools and innovative technologies to create a complete, integrated analytical solution

### Streamline your laboratory workflow with TotalChrom® CDS

The award-winning TotalChrom Chromatography Data Systems (CDS) are the industry standard in chromatography software. With its scalable architecture, 21 CFR Part 11 compliance features and proven algorithms, TotalChrom CDS offer a computing strategy to manage your growing volume of chromatography data quickly, efficiently and safely in both regulated and non-regulated environments. The powerful CDS incorporate powerful reporting features for customized reporting and presentations.



TotalChrom CDS streamline laboratory workflow.



TurboMatrix HS Trap

### Optimize sample throughput with TurboMatrix™ Headspace and Headspace Trap

TurboMatrix Headspace and high-sensitivity Headspace Trap samplers, technologies invented by PerkinElmer, provide unparalleled precision and ease of use for numerous GC or GC/MS volatile-analysis applications. The system can manage up to 12 samples simultaneously, ensuring that the next sample is ready for analysis upon completion of the previous run, achieving significant time savings. Five different models offering a range of capacities are available to satisfy the requirements of virtually any laboratory. Choose the system you need based on your performance and throughput requirements, and TurboMatrix Headspace technology will deliver.

### TurboMatrix Thermal Desorbers speed wide range of applications

The TurboMatrix Thermal Desorption system is another advanced technology from PerkinElmer. Five different TurboMatrix Thermal Desorbers allow you to match throughput and technology to your laboratory and applications needs. Choices range from single-tube and automated 50-tube configurations, with PPC or manual pneumatics. An intuitive, multilingual touch-screen graphical user interface provides complete and easy control. Use this clean technique to simplify and speed up a wide range of GC applications, including indoor and outdoor air monitoring, analysis of flavors/fragrances and analysis of outgassing volatile compounds from packaging, polymers, upholstery, pharmaceuticals and semiconductor materials.



TurboMatrix ATD 650

### Clarus Mass Spectrometer (MS) expands scope of laboratory GC analyses

The Clarus MS is the industry's fastest scanning and widest mass range quadrupole mass spectrometer. When connected to Clarus 680 or 580 Gas Chromatograph, it creates a powerful system for high-performance GC/MS analyses. State-of-the-art electronics process more scans across each peak, resulting in unmatched accuracy and precision and better overall spectral fidelity. Its wide mass range (1-1200  $\mu$ ) encompasses a variety of applications, and a high sensitivity detector offers many new analytical possibilities. Versatile, application-focused TurboMass™ software simplifies data handling and reporting.

### Expert, end-to-end service and support

PerkinElmer manufactures and supports the broadest range of instruments, reagents and consumables in the industry. As the only Gas Chromatography supplier who develops, manufactures, supports and services every product it offers, our knowledge, skills and expertise are unmatched. Our 1200 factory-trained and certified engineers have an average of 15 years of experience maintaining leading-edge scientific equipment, including preventative maintenance, validation support and instrument repair. Plus we provide complete training, technical and applications support, from sample handling to data handling.



Swafer micro-channel flow technology is an innovative and user-friendly approach to automate flow-switching applications.

# PerkinElmer for Complete Application Solutions

## Tested and approved chromatography consumables

PerkinElmer is the only chromatography supplier who develops, manufactures, supports and services every product it offers to provide a truly integrated comprehensive source for all of your chromatography needs.

Your global partner for best-in-class products and superior service and support, PerkinElmer can address all of your chromatography application needs to achieve your measurement goals.

## High Performance, Reliability and Unparalleled Quality

Our team of dedicated Chromatography Specialists has expertise that boasts 60 years of knowledge in understanding your application needs. Serving dynamic and diverse industries with innovation and precision designed consumables, you can rely on PerkinElmer for leading-edge features, availability, and technical support.

A complete catalog of our entire chromatography offering is available free of charge through [www.perkinelmer.com/supplies](http://www.perkinelmer.com/supplies).

## PerkinElmer OneSource: the industry's leading multi-vendor

Through PerkinElmer's OneSource® program, thousands of analytical laboratories around the globe enjoy the benefits of working with a trusted partner that is committed to understanding their needs and helping them achieve their goals. OneSource is the most comprehensive single laboratory supply and service network in the world, delivering the broadest range of services for all types of lab equipment and instrument technologies from every major manufacturer. It's the ultimate resource for labs that need to control costs, optimize operational performance and meet compliance regulations.



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