



BETTER GC FOR THE  
MOST CRITICAL  
APPLICATIONS – YOURS



Clarus® 590/690 GC Systems

  
**PerkinElmer**<sup>®</sup>  
For the Better

# MORE OF WHAT YOU NEED TO GET THE MOST FROM YOUR APPLICATIONS



Clarus 590



Clarus 690



## Food

We offer industry-leading chromatographic solutions to help ensure the quality and safety of food supplies around the world. GC for food quality applications helps food processors to characterize flavor and fragrance profiles of finished goods to meet consumer demands. For food safety, we enable the detection of harmful contaminants and pesticides to help ensure compliance with global regulations to protect human health.



## Environmental

Analytical labs across the globe that perform environmental testing for air, water and soil count on the right techniques and technologies to analyze their samples. Our Clarus 590 and 690 systems are designed for standard regulatory testing to meet agency and industrial regulations. For air monitoring, Clarus systems with TurboMatrix™ ATD technology are the world's most reliable solution for detecting air toxics, ozone precursors, and soil/vapor intrusions.

## Superior sensitivity, capacity, and throughput – with flexibility to handle *more*.

In today's budget-constrained, yet highly competitive laboratory environments, the samples you're being asked to analyze – whether food, pharmaceutical, petrochemical, or environmental – are increasingly difficult. But for some labs, having a dedicated GC for every application isn't an option. For them, a GC that can do it all isn't just a nice-to-have, it's a necessity.

At the same time, regulatory expansion across a wide field of industries means that labs like yours are adopting new, more sophisticated GC technologies that deliver the speed and sensitivity to meet evolving standards. And with your lab's continual budget constraints, you're not only looking for more efficient instrumentation, but also systems that are easy to learn and operate, even for novice users.

Enter our sensitive, high-capacity, high-throughput Clarus 590 and 690 systems. These new instruments build on the strengths of the trusted, proven Clarus platform, delivering

all the powerful and popular features and functionality you've come to rely on.

But the new Clarus platform is a remarkable step forward, delivering a host of features that enable top performance and increased stability: A wide-range flame ionization detector (FID); a new high-performance capillary injector with decreased reactivity; and autosampler technology that delivers multiple options for liquid injection, headspace, and SPME on one system.

Best of all, your lab can still count on the industry's most comprehensive multi-vendor support organization that includes a team of chromatography experts with a breadth of gas chromatography experience that's second to none.

The new Clarus 590 and 690 systems: Better for the world's most important applications – the ones that are most important to you.



### Petrochemical

Our Arnel GC-based solutions offer today's laboratories the most complete line of analytical systems for the petrochemical industry, including reliable instrumentation and the service and support you need to run chromatographic analyses successfully. From refinery gas analyzers to simulated distillation, we offer a variety of standard analyzers and custom solutions that enable you to meet your industry's regulatory requirements.



### Pharmaceuticals

Clarus 590 and 690 systems provide unprecedented operational simplicity and outstanding flexibility while removing the barriers to productivity that come with demanding samples and applications. With powerful headspace sampling capabilities, these systems are ideal for the analysis of residual solvents in inert and active ingredients in pharmaceuticals.

# BETTER GC IS ALL ABOUT TECHNOLOGY AND RESULTS

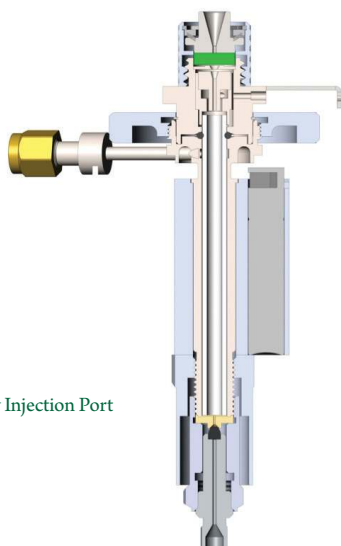
For laboratories looking for a single GC that's flexible enough to handle all types of critical samples, the Clarus 590 and 690 systems are the ideal choice – a proven high-performance GC platform that delivers the stringent sensitivity and characterization you need. And they're designed to meet your varied analytical requirements – and the experience levels of the people who run them.

## Injecting better performance into the equation

Getting the sample to the column more efficiently means better sensitivity, reduced carryover and reactivity, improved linearity in calibration curves – and improved performance for the applications that matter to you. That's the whole idea behind our new capillary injection port.

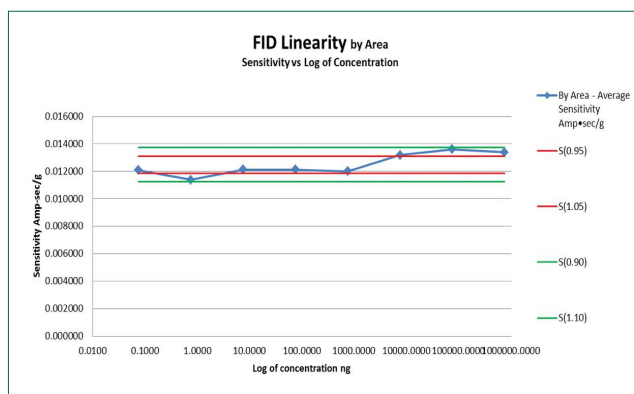
Clarus 590 and 690 systems optimize the geometry and heating of the injection port, which improves sample transfer to the column. The new design makes it easier to access the liner for quick routine maintenance.

Plus, the industry-standard liner size and gold-seal interface at the bottom of the injection port enable you to standardize on the consumables that fit your application best. It's all about *your* convenience.



## Making reruns a thing of the past

The Clarus 590 and 690 systems' all-new wide-range flame ionization detector (FID) measures hydrocarbon compounds at very low and very high levels, with a linear response range of  $10^7$ . That allows you to accurately quantitate the largest and smallest peaks on a chromatogram without changes to range or attenuation. That means you're able to report more samples without reruns or complex setting of detector-timed events – perfect for applications such as testing for residual solvents in pharmaceuticals.



The new wide-range FID amplifier allows you to quantitate more accurately, up to seven orders of magnitude.



## Great results start with good preparation

Our proprietary TurboMatrix™ Headspace technology still provides unparalleled precision and ease of use for a wide variety of GC and GC/MS applications, including volatiles in water, blood/ alcohol, and residual solvents. At the same time, our TurboMatrix Thermal Desorption technology delivers exceptional performance and throughput for indoor and outdoor air monitoring, fragrance and flavor analysis, and outgassing analysis from packaging and polymers. And we've rounded out our offering with the addition of our TurboMatrix MultiPrep autosamplers. These rail-based systems can handle liquid injection and sample handling (on the standard configuration), plus headspace and SPME on the MultiPrep+ system, for the highest levels of throughput and flexibility. This is simply the most versatile sample-handling portfolio in the industry today.

TurboMatrix MultiPrep systems also include advanced functionality, including mixing, barcode reading, washing, dilution, and derivatization, all on a single system. Best of all, you can switch between all these modes of operation automatically – making it an ideal multipurpose system for any scientist in any size lab.

For applications that don't require advanced functionality, the 108-vial integrated autosampler provides exceptional flexibility with its access to both injection ports permitting any combination of analyses. And autosampler pre-rinse performs time-consuming syringe washes while the GC gets ready, saving time between runs and injection-to-injection time.



## Simple automation for flow-switching applications

With our programmable pneumatic control for injectors and detectors, the carrier gas flow adjusts automatically to compensate for ambient temperature and pressure, giving you constant retention-time reproducibility under all conditions. And our Swafer™ microchannel flow technology automates flow-switching applications – including column and detector switching, as well as advanced techniques such as backflush and heart-cut. What's more, Swafer technology makes it easy to set up configuration changes without the need for service information.



TurboMatrix ATD



TurboMatrix HS



TurboMatrix MultiPrep



Swafer Micro-channel Flow Technology

## Which Clarus is Right For You?

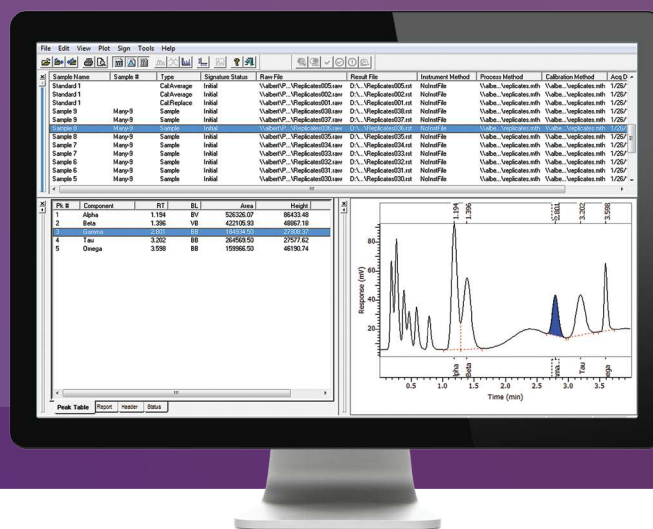
Regardless of which Clarus system you choose, you're getting proven, high-performance technology that labs the world over rely on and trust. The robust autosampler on both systems delivers easy access to two injector ports, and each delivers a host of other features to maximize productivity, including:

- A wide range of injectors, including programmable and on-column
- All common detectors, including ECD, TCD, and FPD
- Multilanguage touchscreen operation
- Swafer flow-control capabilities
- Arnel custom-engineered turnkey petroleum applications

When the highest levels of throughput are critical to your operations, choose the Clarus 690. Its patented high-performance oven delivers the fastest heat-up and cool-down of any oven in the business, and that means shorter injection-to-injection times, and the ability to run more samples per day. Plus, the oven's twin-wall design with concentric air exhaust provides exceptional cooling to near-ambient temperatures without resorting to liquid cryogen – critical for analysis of VOCs.

# EVERYTHING COMES TOGETHER FOR BETTER LAB PERFORMANCE

We tend to think of the big innovations as the driving force that moves your science ahead. But often it's the simple things that come together to make your day-to-day scientific routines more productive and meaningful. Ease-of-use features and easy-to-learn software, turnkey solutions, and world-class multi-vendor service and support are key factors in taking your lab to the next level.



## A total software solution for GC

Our TotalChrom™ chromatography data system is designed from the ground up to fit your workflow and maximize your lab's productivity, enabling you to acquire, process, report, review, and approve data, all in a streamlined series of operations. TotalChrom software delivers a comprehensive computing strategy that lets you manage your GC data quickly and securely, whether yours is a regulated or nonregulated lab environment.

When configured for the Clarus 590 or 690 systems, TotalChrom software can serve as both an instrument controller and a data management system, making it the best choice for data handling in demanding multiuser, multisite environments where a number of instruments are in use. Plus, the TotalChrom system's unique data protection features ensure that data acquisition processes aren't disrupted or compromised.

## Arnel Turnkey Solutions For Your Most Complex Petrochemical Challenges

To meet the demands of complex testing procedures and ever-changing regulatory strictures, we deliver more than one hundred preconfigured, turnkey solutions for a wide range of petrochemical applications. These Arnel-based solutions include:

- **Detailed hydrocarbons:** A simple, sensitive, cost effective solution for evaluating raw materials and control refinery processes
- **Simulated distillation:** A complete, ready-to-go solution for determining the true boiling-point distribution simulating the physical distillation of petroleum raw materials and products
- **Natural gas analysis:** Technologies for all types of natural gas samples, analyzing all components of interest in samples using TC and FID detection
- **Transformer oil gas:** Measures the levels of light gases found in an electrical transformer's insulating oil
- **Refinery gas analysis:** Tests for all variables and conditions and most types of samples encountered in the analysis of refinery gas

We set and test all the method parameters, and deliver fully configured systems that you can use to start analyzing samples right away. And if we don't have a standard solution, we'll work with you to identify your need and develop a solution that's just right for your lab.

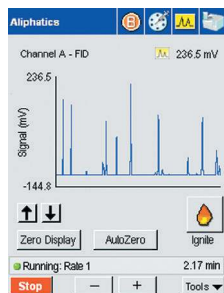
## We're taking complexity and making it simple

Ours were the first GCs in the industry to be equipped with a large, full-color touchscreen interface – and on the way, we redefined accessibility and usability. The signal screen displays on Clarus 590 and 690 systems give you a real-time chromatogram so you can easily monitor the current state of the instrument. The signal monitors two channels simultaneously at the press of a button, so you get your critical information right where and when you need it. Plus, this intuitive signal display supports eight languages – English, Spanish, French, German, Italian, Russian, Japanese, and Chinese – fostering routine interaction and getting *everybody* in your organization up to speed and proficient with the instrument.

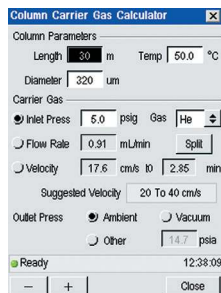
Clarus 590 and 690 systems deliver one-touch access to all the functionality you need, eliminating drilldown and simplifying instrument control for scientists at all skill levels. What's more, the status screen allows you to gain a comprehensive view of all system functionality via easy-to-understand icon buttons that define the type and status of each heated zone and identify injectors and detectors with ease.

## Making method development easy

The touchscreen interface is perfect for method development, too. That's because it provides immediate access to all method parameters, in whatever order you choose – and that eliminates the need for linear entry of analysis conditions. Our proprietary integrated flow calculator enables optimized adjustment of carrier-gas conditions – no separate software program necessary. You decide the variable target level and the instrument automatically determines the right conditions for your analysis. And the touchscreen interface keeps track of the number of injections and notifies you when to replace the septa and maintain your instrument – automatically.



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



Built-in flow calculator determines flow rate at a given column length and diameter.

# THE RIGHT CONSUMABLES FOR YOUR APPLICATIONS



Our extensive portfolio of high-quality GC and GC/MS consumables can ensure the continual optimal performance of your system. From sample handling, syringes, vials and septa, and injection port consumables such as liners, seals, and ferrules, to inert GC columns and gas filters for uninterrupted impurity removal, we have everything you need to get the most from your instruments:

- Highest quality vials (both headspace and standard analytical), caps, and septa, which eliminate contamination that can lead to interferences and failures that affect lab productivity – all tested to our stringent requirements
- Ultra Clean™ gas filters that remove hydrocarbons, oxygen, and moisture, resulting in 99.9999% pure gas quality – for continuous sensitivity and accuracy
- Broad range of liners to suit your application needs that vary in inner diameter and internal geometry, plus our new range of liners for more stable deactivation and reduced low level analyte breakdown through a revolutionary new deactivation process
- Autosampler syringes that meet high precision requirements for reproducible injections, day after day, month after month
- SPME sampling for improved detection limits while maintaining resolution, plus easy method development with a range of fibre chemistry coatings and film thicknesses available

Our consumables are designed to give you greater confidence in your results – time after time – so your instruments run efficiently and you can focus on your applications.



# THE PATH TO LAB EFFICIENCY STARTS HERE



In today's complex laboratory environments, every function has to work in sync toward the common goal: lab efficiency in the service of scientific discovery and progress. And that's the overarching goal of OneSource® Laboratory Services, too. We deliver solutions that cover all aspects of scientific lab operations and can be customized for the scientific workflows – and business outcomes – you're driving toward.

Simply put, OneSource is the one service organization with the requisite understanding of lab and R&D needs, delivering a customized systems approach to your success. With a full measure of insight and expertise, our consultants can pinpoint the issues and inefficiencies and engineer the right solutions to solve your scientific and business challenges.

From everyday instrument repair and service to compliance and validation, from laboratory IT service to consulting and scientific staffing, OneSource Laboratory Services can help streamline your lab routines and get your scientists back to their main order of business – science.

## A Powerful Portfolio of Chromatography Systems

With the addition of the Clarus 590 and 690 systems, we're delivering the industry's most comprehensive line of chromatography instrumentation – from GC and LC powerhouses to the fastest portable systems in the business.



### Clarus® SQ8 GC/MS

With the flexibility to choose your level of sensitivity and dynamic range, the Clarus SQ8 eliminates background noise, maximizes analyte signals, and enables you to virtually reconfigure between EI and CI, simply and quickly.



### Q Sight™ LC/MS/MS

A triple-quad LC/MS/MS solution that provides high sensitivity and high throughput, with straightforward operation – from sample preparation to results and reporting. And it gives you 15% more uptime due to a self-cleaning source that requires virtually no maintenance.



### Torion® Portable GC/MS

Test samples where hazardous events occur: No sample processing, packaging, and prep time. You simply respond, collect, analyze, and identify on the ground. And that means remedial action 70 times faster than with conventional labs.



### Flexar™ LC and UHPLC

Our rugged, reliable LC is ideal for standard applications, while our UHPLC delivers ultrahigh performance and throughput for complex analyses. And you can choose from an array of pumps, detectors, and autosamplers to meet your precise requirements.



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