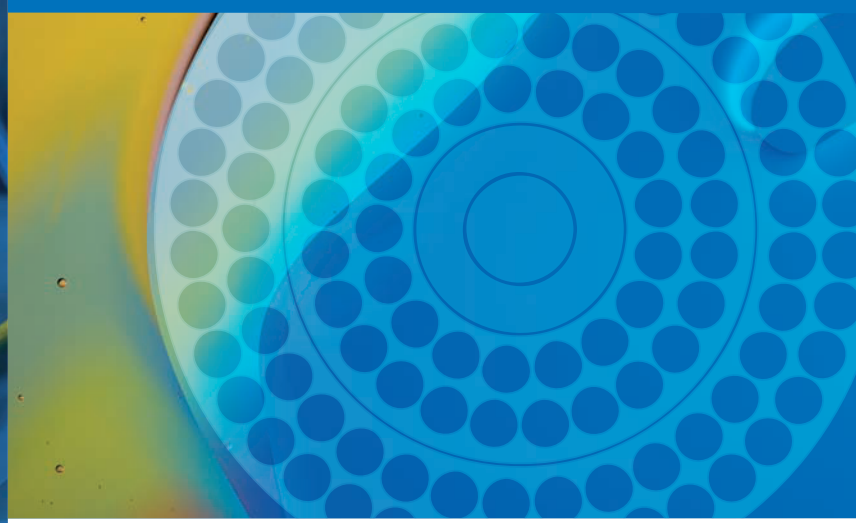
Presearch
A DIVISION OF UNITECH UK

BRUKER

Chemical Analysis



400-GC Series

- Gas Chromatography Solutions

think forward

Gas Chromatography

Superior Solutions for GC Analyses

New Bruker 400-GC Series gas chromatographs now provide faster separations, increased confidence in analytical results and an outstanding range of complete solutions.

Bruker provides you with unrivalled expertise, not only in building robust instruments, but also in creating superior solutions to real world problems. We design and manufacture GC instruments and even complete customized analysis systems in a way which ensures that we have total control over all processes and quality procedures.

450-GC - for fully-featured, flexible GC

- Provides the flexibility and performance to suit the widest range of application needs
- Can be easily modified or expanded as your analysis requirements change
- Designed for manual or fully automated operation
- Powerful, customizable software for superior data analysis and faster throughput
- Intuitive operation via the advanced local user interface or Galaxie™ Chromatography Data Handling Software from Bruker

430-GC – for routine, dedicated use

- Comparable performance to the 450-GC in a small, single channel package
- Compact size permits the 430-GC to fit into any laboratory environment
- Simple User Interface allows the 430-GC to be used with minimal training and skill level
- Full size oven accommodates conventional capillary or packed columns – no method re-development required to use non-standard column types

430-GC: "450-GC performance" in a Single Channel Package
Single channel design – one injector and one detector type.

Simple, intuitive user interface which requires no training.

Full sized high performance oven accepts conventional columns.

Flexibility and Performance

High resolution color touch screen display with stylus for convenient and precise operation

Up to three standard injectors and detectors

Single liquid injector can access two inlets automatically

Inert GC UltiMetal™ surface deactivation treatment available

GC "Front page" is clearly readable from a distance

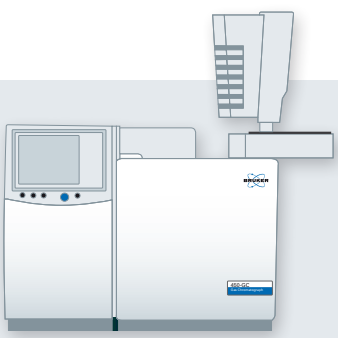
Fully integrated electronic gas control

Galaxie™ Chromatography Software from Bruker – easy to use, yet powerful!

Two Ovens in a Small Footprint

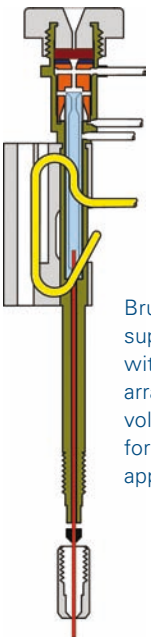
If you need to run two applications with different oven temperature profiles at the same time, you could purchase two single channel 430-GCs (= 2 column ovens). This allows you to achieve true dual channel throughput instead of trying to do so using a multi-channel GC with only one oven. This approach requires no more bench space in the laboratory.

430-GC - Dimensions:
55 cm (h) x 32 cm (w) x 56 cm (d)



450-GC - Dimensions:
53 cm (h) x 66 cm (w) x 56 cm (d)

Widest Range of Injectors



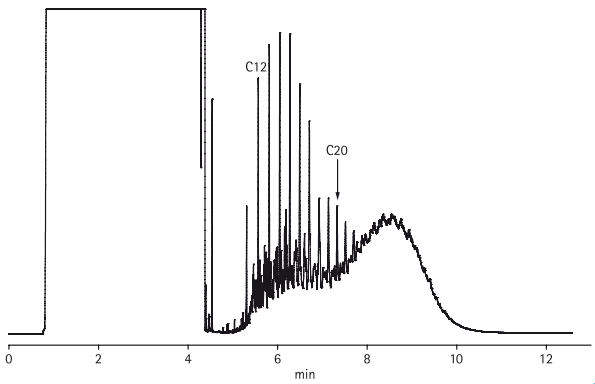
Bruker can supply you with a flexible array of large volume liners for different applications.

Bruker offers an injector range to meet virtually all application requirements. All are equipped with the convenience of advanced Electronic Flow Control (EFC).

Choose up to three injectors from the following types:

- Split/splitless: the most common capillary injector in use today, featuring optimized dual split vent design, digital pressure control, column flow and split vent flow. A wide array of liner types is available, depending on your application.
- Large volume injector (LVI): sometimes referred to as a programmable temperature vaporizer (PTV) – the most flexible injector type; fully temperature programmable; up to 250 µL of sample can be injected to dramatically increase sensitivity and reduce sample preparation time and cost.
- Cool On-Column (COC): the sample is deposited directly onto the capillary column; eliminates sample discrimination or thermal decomposition; the preferred choice for high temperature capillary analysis or thermally labile analytes.
- Packed/On-Column: includes liners for use with wide bore capillary (0.53 mm ID) columns and 1/4" or 1/8" metal or glass packed columns.
- Packed: for sample introduction directly onto traditional 1/4" or 1/8" packed columns.
- All injectors are available with UltiMetal™ surface deactivation treatment for labile or polar/reactive components.

Mineral oil analysis using LVI



An analysis of mineral oil generated using the LVI injector. Note how sharply the solvent peak ends, attributable to the flexibility and performance of the LVI.

Injector Selection Guide – Sample/Analysis Characteristics or Requirements

Trace Analysis	Separation & Speed	Sample Capacity	Wide Range of Analytes	Preferred Column Type	1st Choice Injector	2nd Choice Injector
x				Capillary, 0.53 mm ID	Large Volume (LVI)	Split/Splitless
	x			Capillary, 0.1 to 0.53 mm ID	Split/Splitless	Large Volume (LVI) SS Mode
	x	x		Capillary, 0.53 mm ID	Large Volume (LVI)	
	x		x	Capillary, 0.53 mm ID	Cool On-Column	Large Volume (LVI) PTV Mode
x	x		x	Capillary, retention gap with 0.1 to 0.32 mm ID	Cool On-Column	Large Volume (LVI)
	x			Capillary, 0.53 mm ID	Packed	Large Volume (LVI) PTV Mode
			x	Capillary, 0.53 mm ID	Cool On-Column	Large Volume (LVI) On-Column Mode

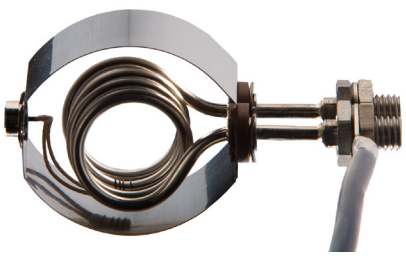
Excellent Separation Performance and Robustness

Reduce sample analysis time

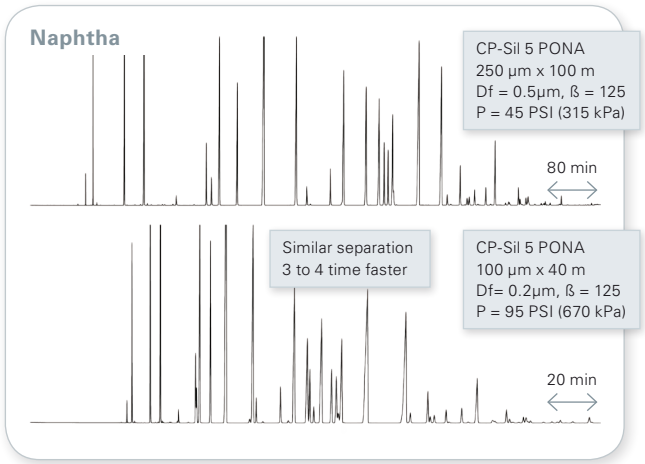
Detailed hydrocarbon analysis is often the preferred technique to fully characterize petroleum streams. The technique is based on the identification of individual components using high performance, high resolution capillary gas chromatography. Standard 0.25µm x 100 m columns are normally used. Choosing a smaller column diameter improves the analysis time up to a factor 4.

The integrated sample enrichment

The Sample Preconcentration Trap (SPT) enables enrichment of impurities in gaseous samples like Air. Its small size mounted on top of and the control via the 450-GC allows a system detection limit enhancement by at least a factor 100. The SPT cryogenically traps the analytes using a variety of adsorbents and fully vaporizes the analytes with 40°C/s to ensure sharp injection profiles on to the column.

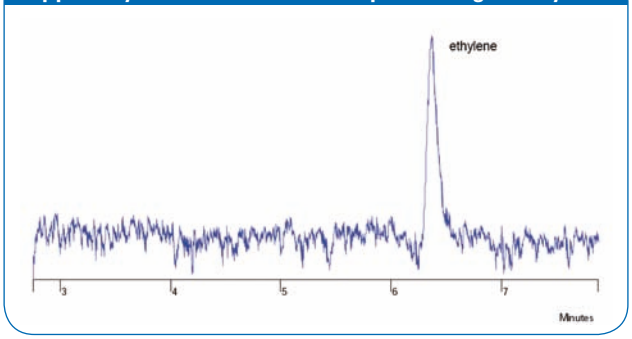


Enhanced sensitivity. The patented SPT concentrates trace analytes in air and gas samples for on-line processes and field samples brought to the laboratory.



The analysis of Naphtha on a 100m x 0.25µm and 40m x 0.10µm. Choosing a shorter column with a smaller internal diameter results in the same analytical performance but reduces the analysis time by a factor four.

2 ppb ethylene in air from a food processing facility



Your choice of packing. With the Bruker SPT, select from a variety of different packing materials for optimum selectivity and maximum sensitivity.

Fast, Flexible Detection

Bruker's range of GC and MS detectors deliver industry leading sensitivity, ease of operation and outstanding ruggedness for even the most challenging applications requirements. Bruker's selective GC detectors have been the preferred choice of customers around the world for years. And, now all of Bruker's detectors feature fast data rates for rapid separations and greater analysis throughput.

We offer the following comprehensive choice of detectors:

Detector	Universal Response
FID	Flame Ionization Detector
TCD	Thermal Conductivity Detector
PDHID or HID	Pulsed Discharge Helium Ionization
MS	Mass Spectrometer (Scan mode)

Detector	Selective Response	Selective to
ECD	Electron Capture Detector	Halogens
PFPD	Pulsed Flame Photometric Detector	S, P, N and 25 other elements
TSD or NPD	Thermionic Specific Detector	N and P
MS	Mass Spectrometer	Scan modes: Q1MS, Q3MS, Precursor, Product, Neutral Loss, Selected Ion Monitoring (SIM), Multiple Reaction Monitoring (MRM)

Detector Selection Guide

Detector	Application range	Industry most commonly used	Popular application areas
FID	Composition and impurities	Petroleum/Petrochemical	Hydrocarbons: gasoline, naphtha, BTX
TCD	Composition	Petroleum/Petrochemical	Air, fuel gases (natural gas)
ECD	Impurities and trace analysis	Agricultural/Environmental	Pesticides, chlorofluorocarbons (CFCs)
PFPD	Impurities and trace analysis	Environmental/Petroleum/Food & Beverages	Pesticides, herbicides, sulfur gases/mercaptans, amines
TSD	Impurities and trace analysis	Environmental/Food & Beverages	Pesticides, amines, drugs
PDHID	Impurities and trace analysis	Petroleum/Petrochemical	Air, fuel gases, ethylene/propylene impurities
MS	Composition, impurities and trace analysis	Food Safety, Forensic/Toxicology, Academic Core Labs, Environmental	Water/waste water, pesticides, pollutant monitoring

Composition analysis ranges from ppm to high % levels; impurity analysis ranges from sub ppm to low % levels; trace analysis ranges from ppm levels and lower.

Advanced Detection

Mass spectrometers

Bruker is a leading supplier of gas chromatography/mass spectrometry systems, providing quadrupole mass spectrometers coupled to Bruker gas chromatographs. The GC/MS series from Bruker provides MS capabilities for every application. Compound identification and quantitation is optimized, with a wide choice of MS and MS/MS modes.

Bruker's innovative 320-MS

Electron capture detector (ECD)

The industry-leading sensitivity and robustness of Bruker's ECD makes it ideal for the very toughest applications. It is the first choice for environmental detection due to its outstanding detection of PCBs, organochlorine pesticides, herbicides and halogenated hydrocarbons.

Pulsed flame photometric detector (PFPD)

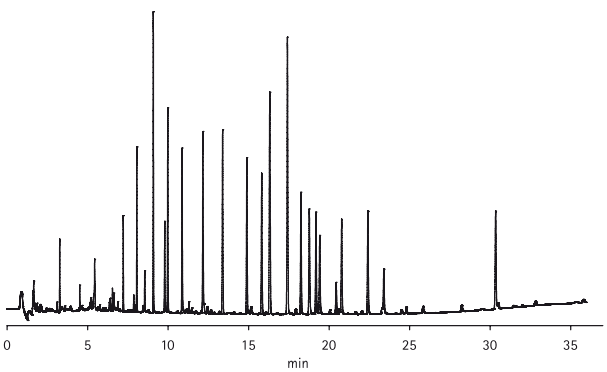
The Pulsed Flame Photometric Detector was developed in the 1990s to eliminate the problem of background carbon emission encountered with conventional flame photometry as well as to offer the flexibility to selectively detect more than just S and P containing compounds. Up to 28 different elemental species can be detected with the PFPD, making it the most versatile GC detector.

Typical applications include:

- Sulfur in petroleum feedstocks and natural gas
- Sulfur, phosphorus, nitrogen and arsenic in chemical warfare agents
- Sulfur gases and nitrogen impurities in beverage grade CO_2
- Nitrosamines in processed foods
- Organophosphorus pesticides in water, soil, sludge

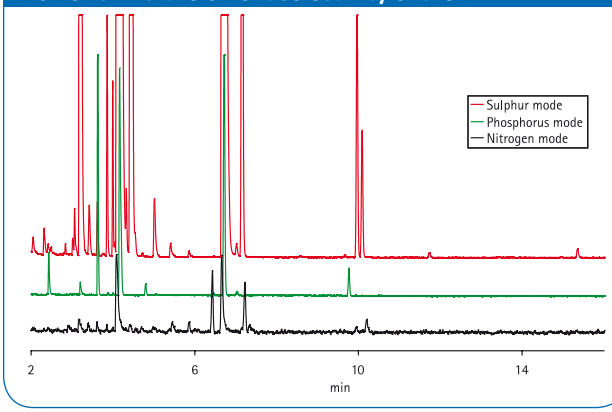
The PFPD set-up software enables you to quickly optimize the detector and obtain additional qualitative information. Emission data can be saved as a data file and viewed, and used to generate multi-element chromatograms.

ECD – outstanding sensitivity



Chloro-pesticide analysis using GC/ECD according to EPA 8081, 20 pg injected.

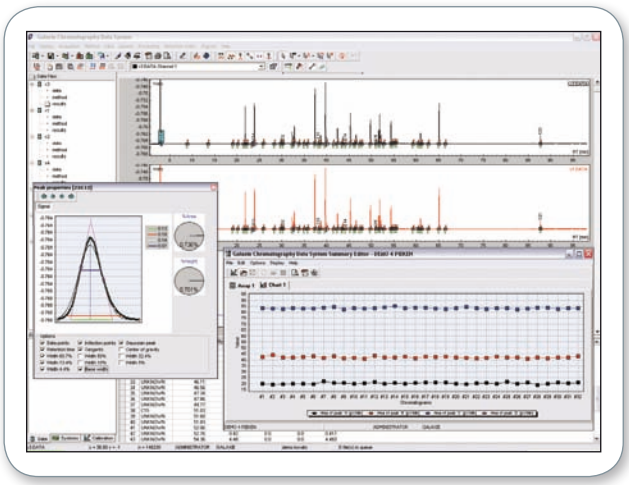
Powerful multi-element selectivity of the PFPD



The chromatograms above show the analysis of broccoli using a 450-GC equipped with a PFPD in which three different elements were selected: sulfur, phosphorus and nitrogen.

Data: Making Sense of It

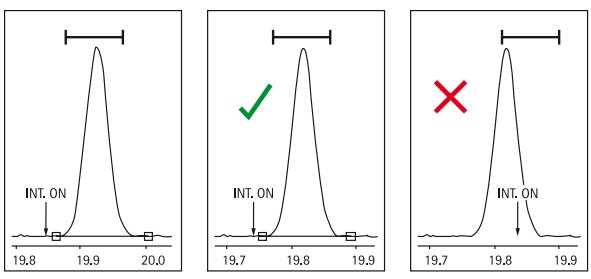
Bruker's 400-Series GCs can provide you with a vast amount of analysis data in a short period of time. A key challenge is to be able to process all of that data quickly and reliably, so that business decisions can be made faster and better. Bruker's Galaxie™ Chromatography Software has been designed with that goal fully in mind.



Galaxie™ Chromatography Software - easy to use, yet powerful.

The following are some examples of how Galaxie™ can improve both your ability to conduct data analysis and achieve the laboratory throughput you require.

Adjust peak integration parameters



Galaxie™ SmartTimeUpdate allows you to correct for eventual time shift. Request a copy of the Galaxie™ brochure for more information.

Galaxie™ SmartTimeUpdate

In order to adjust retention time shift, e.g. due to column wear, SmartTimeUpdate can automatically adjust the peak integration parameters (a post run process), leaving the original GC method intact. This approach ensures conformance with GLP requirements, unlike "locking" mechanisms which make adjustments to the instrument method.

Flexible reporting and customizable calculations

The results obtained from your GC are very easy to confirm and validate using Galaxie's™ flexible Report Editor and Statistical Tools. For example, the trend and control charting function will automatically notify you if the GC is unable to generate results within the validated scope of the method or prevent you doing so until the problem is resolved, if required.

Industry/application "Plug In" software modules

For easy operation, Galaxie™ software features a number of "plug in" modules which enable you to analyze samples in accordance with industry standard methods and makes it easy to perform special calculations or reports.

Examples include:

- Simulated Distillation
- Detailed Hydrocarbon Analysis
- Hydrocarbon Group Separation (PIONA)
- Peak Matching for Flavors
- Multi-Channel Reports
- Calorific Value of Natural Gas

Maximizing Your Sample Throughput

Versatile autosamplers minimize errors and reduce costs

The CP-8400 AutoSampler provides high throughput with a standard 100 sample carousel for 2 mL vials. The CP-8410 AutoInjector provides flexibility with a fixed tray for 2 mL, 5 mL, and 10 mL vials.

- High sample throughput with dual and duplicate modes of injection
- Automatically access two injectors with a single tower
- Minimize method development time with preprogrammed modes of injection
- Liquid, ambient headspace, and SPME sampling

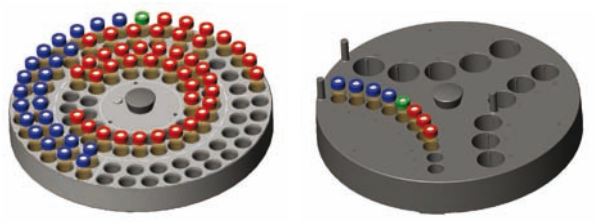
AutoSamplers elevate GC automation to new levels of reliability, productivity, and performance.

The CP-8400 and CP-8410 automated liquid samplers

- Up to 100 samples can be run sequentially (CP-8400)
- Accommodates 2, 5 and 10 mL sample vials (CP-8410)
- Provides the ability to access two injection ports sequentially to double analysis output
- Can be used to perform ambient headspace sampling and solid phase micro-extraction (SPME)
- Increases sample throughput via dual and/or duplicate injection modes
- Pre-programmed injection modes minimize method development time and guesswork

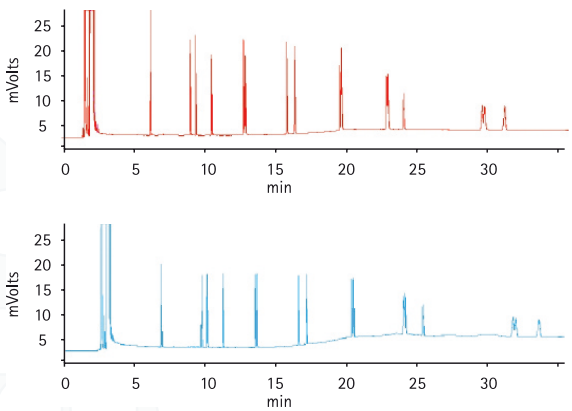
For laboratories requiring even greater sample throughput or more extensive sample preparation automation options, Bruker offers the CombiPAL system.

The CP-8400. Automatic access to two injection ports allows you to double your throughput. These can be installed in addition to gas or liquid Sample injection valves for optimum flexibility.



To suit your number of samples, the CP-8400 AutoSampler and CP-8410 AutoInjector deliver accurate, precise injections of small or large samples with virtually no sample carry over.

Dual throughput



Dual Sample injection mode is used for a 16 component PAH mixture without the need for a second sampler.

Bruker Custom GC Solutions

The industry's GC solution leader

The term "solution" means different things to different people. Some users require only reliable GC hardware which they can adapt to their specific needs. Others may not have the time, knowledge or skill set to do this and prefer that their supplier does this for them. Frequently, the customer wants something "in between". Bruker provides all levels of solutions from hardware only up to fully tested Analyzers.

Solution: Pre-defined hardware configurations

This is a standard GC which requires modification to meet the user's specific analytical requirements. The user is responsible for the analysis method and the end results. Examples include:

- Single or multi valve/plumbing configurations
- Adding a multi-stream gas sampling system
- Adding a Deans switching device

There are over 75 pre-defined configurations available to meet a very wide range of analysis needs.

Bruker GC solutions

Pre-defined hardware configuration	Standard analyzers	Custom Solutions
Save time by having standard hardware modified to your specific analysis requirements at Bruker's factory	Pre-configured for the best results based on industry standard methods	Bruker will build, test and validate solutions to your specific requirements, saving you precious method development time

Solution: standard analyzers

Bruker configures and tests gas chromatography hardware and software according to widely used industry standard methods (e.g. ASTM, UOP, EN, ISO, GPA), to save you time and to ensure confidence in your results. Standard analyzers are configured to meet the performance specifications outlined in the method itself. Included in these analyzers are:

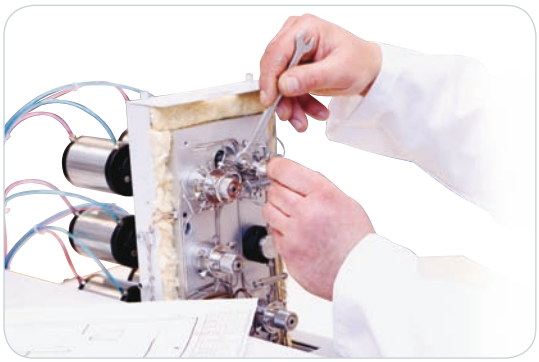
- All hardware
- Software (including special application "plug ins" where appropriate)
- Pre-installed methods
- Test chromatograms
- Installation/validation sample
- User documentation customized for the specific method

The PIONA+™ – Just one example of a standard analyzer from Bruker.

Simulated Distillation	Refinery Gases	Oxygenates	Detailed Hydrocarbon Analysis
Hydrocarbon Group Analysis (PIONA)	Transformer Oil Gas	Natural Gas	Sulfur in Gas
Residual Solvents	Biodiesel	Beverage Grade CO_2	Mineral Oil

Examples of standard GC analyzers from Bruker.

Bringing It All Together For You



Experts in Custom Solutions

Solution: Custom solution GC

Bruker can configure, test, and validate solutions on standard or non-standard GCs for customers with specific analytical requirements. This is the ideal solution for laboratories that need to conduct company-specific GC analysis but lack the necessary experience or do not have the time to undertake method development or fine tune a method.

Our sales consultants and Custom Solution Office work together to create a comprehensive GC solution specifically for you.

Designed for serviceability and support

Bruker is pleased to offer the Bruker Care Program, to provide you with a range of training, service and support programs for the type and level of support you require. Our goal is to help you increase your productivity, maximize your uptime and achieve the highest possible return on your investment. Bruker's experienced and highly qualified support organization is strategically located throughout the world to ensure rapid response.

Choose from:

Our Care Program	Benefits
TotalCare	Comprehensive support from Bruker ensures continuous, high performance operation and superior cost efficiency.
RepairCare	Designed to maximize uptime, improve productivity and the performance needed for your application.
PreCare	Planned maintenance prevents instrument performance problems before they become sample analysis problems.
ExtendCare	Plan your instrument purchase with future services in mind. Eliminates the variable cost of service, freezes inflation and avoids administration with renewals.
CustomCare	Can include special customer defined services not offered in a standard agreement. Whether it is applications assistance, AIQ, training, or staffing a full- or part-time Bruker employee at your facility, we have the custom solution to meet your needs.
EduCare	Includes training courses, on-site training, applications assistance, web-based and customized training programs. The cost of a well-trained employee is fully paid for in productivity gains – usually within only a few weeks or months.

Contact us for more information, on service@bdal.de

Chemical Analysis Solutions

GC quadrupole mass spectrometers

The Bruker 300-MS series GC/MS systems stand at the pinnacle of versatility for quadrupole mass spectrometer systems. Both the 300-MS and 320-MS are configurable as either single-quadrupole, or triple-quadrupole systems.

The 300-MS delivers the performance you've come to expect from an industry leader in quadrupole innovation. It features an 800 Da mass range, superior negative ion sensitivity, and unmatched robustness in its performance class. The 320-MS delivers femtogram sensitivity, 2000 Da mass range, and a wide array of chromatographic and ionization configurations to uniquely match your needs - all in less than 72 cm. (28 in.) of linear bench space! In minutes, our 300-MS series systems can be changed from EI to CI modes of operation. Easily, our 300-MS and 320-MS are the most sensitive, robust, and flexible quadrupole GC/MS systems currently available.

ICP mass spectrometers

Choosing an ICP-MS for your elemental analysis needs has never been easier with the Bruker 800-MS Series. The 810-MS is the instrument of choice for routine analysis with industry leading sensitivity and intuitive Web-integrated ICP-MS Expert software. The 820-MS features Bruker's novel collision reaction interface (CRI), providing interference-free analysis and allowing you to tackle any application with ease. With a vast range of accessories, Bruker has the solution to all your ICP-MS application requirements.

For research use only. Not for use in diagnostic procedures.

Bruker Daltonik GmbH

Bremen · Germany
Phone +49 (421) 2205-0
Fax +49 (421) 2205-103
sales@bdal.de

www.bruker.com/chemicalanalysis

Bruker Daltonics Inc.

Billerica, MA · USA
Phone +1 (978) 663-3660
Fax +1 (978) 667-5993
ms-sales@bdal.com

Presearch UK Limited

Basingstoke, Hampshire RG24 8PZ
Phone 01256 365492
Fax 01256 365486
contactus@presearch.co.uk

www.presearch.co.uk