

# PRODUCT PORTFOLIO



*Elemental Analyzers (CHNS + O + Cl, N/protein, TOC)  
Optical Emission Spectrometers (OES) • Software  
Stable Isotope Ratio Mass Spectrometers (IRMS)*

## EXCELLENCE IN ELEMENTS AND ISOTOPES

### Leadership through Innovation

ELEMENTAR offers the most dynamic range of analyzers for high performance analysis of organic and inorganic elements. Incorporating over 110 years of innovation and development into a **technology-leading comprehensive product portfolio**, Elementar targets the needs of many market sectors including Environmental, Agriculture, Fuels, Materials, Chemical Research and Forensics.

### Always a Future-Proof Investment

Thanks to the outstanding robustness and longevity, analyzers include a **10 year warranty on high temperature combustion furnace and thermo-conductivity detector (TCD) cell**. With the confidence that you will receive the highest level of technical support from our experienced team, Elementar provides **spare parts for a minimum of 10 years after the end of production**. This results in outstanding low cost of ownership and gives customers confidence in return of investment.

- Proprietary features not only save costs but deliver results faster with the highest accuracy.
- High performance components and strict quality control ensure industry-leading quality, reliability and robustness.
- Feature-rich software packages and clearly arranged, easily accessible system components simplify daily operation.
- Highly-skilled, well-trained application support help customers get solutions for those tough-to-run samples.



## Organic Elemental Analysis

Our analyzers for Organic Elemental Analysis are designed to offer industry-leading versatility in elemental analysis. Thanks to our proprietary Advanced Purge and Trap (APT) technology even the most challenging C : N elemental ratios of up to 12,000 : 1 can be reliably measured. Optional conversion kits make it possible to upgrade every instrument at any time for special applications.



	UNICUBE®	vario EL cube	vario MACRO cube	vario MAX cube
Elements	CHNS and O or Cl with multiple modes			N, CN, CNS
Max. C content	14 mg (50 mg in CN mode)	40 mg	150 mg	500 mg
Sample weight (for soils with 1% C)	< 0.5 g	< 1 g	< 1.5 g	< 5 g
Sample homogeneity (recommended)	high	high	medium	low
Ash removal	manual			automatic



### UNICUBE® trace

- Detection limit of 10 ppm N
- Low total cost of ownership
- Integrated 120 position autosampler as standard



### rapid OXY cube®

- Industry-leading performance
- Blank-free oxygen detection
- 1450 °C furnace temperature for matrix-independent results
- Integrated 120 position autosampler as standard



### trace SN cube

- Industry-leading performance and versatility
- Detection limit of 6 ppb for sulfur
- Detection limit of 15 ppb for nitrogen
- For liquids, LPG, gas and solid samples



### LPG Module

- 20 µl sample loop, multipoint valve and heated tube
- Injection of LPG without soot formation



### Gas Module

- Injection of gaseous samples up to 60 bar
- 20 ml gas loop volume



### rapid CS cube

- Fast analysis time
- Integrated 60 position autosampler as standard
- Chlorine determination as an option

## N/Protein Analysis

Our N/protein analyzers use the high-temperature combustion method according to Dumas, which has clear advantages over Kjeldahl regarding laboratory safety, sample throughput, labor time, amount of chemical waste and thus cost-per-analysis. Our analyzers for the determination of N/protein are dedicated instruments serving today's customer needs in regards to price-per-sample, throughput and sensitivity.



### rapid N exceed®

- Lowest cost per sample
- Inexpensive CO<sub>2</sub> as carrier gas
- EAS REDUCTOR® for up to 2,000 samples
- Fastest analysis (3-4 min.)



### rapid MAX N exceed

- Simplified sample preparation
- Argon as carrier gas (helium optional)
- EAS REDUCTOR® for over 1,000 samples
- Advanced crucible technology with automatic ash removal

## TOC & Water Analysis

Our TOC analyzers offer fast and easy determination of total organic carbon in water and solids. Packed with innovative technologies and features, the robust design guarantees highest possible uptime and unrivaled performance for routine operation.



### acquray® series

- Optimized UV/persulfate digestion for trace TOC analysis
- Large reactor and injection volumes up to 40 ml
- Best price-to-performance ratio
- Option for TOC, ROC and TIC in solids
- Options for TN and TP in water



### vario TOC cube

- Choice between two IR detectors for trace and standard TOC analysis
- Industry-leading performance and versatility
- Optional automated sample feeding for solids
- External CLD for trace TN<sub>b</sub> analysis



### enviro TOC

- Customized for TOC in environmental water and wastewater
- 60-position autosampler for 40 ml EPA vials
- Unique matrix separation with SALTRAP
- Optional automated sample feeding for solids
- Choice between integrated CLD and EC cell for TN<sub>b</sub> determination



### soli TOC® cube

- Precise temperature programming with fast heating rates
- Optional carrier gas switching for better separation of ROC and TIC
- Option to determine nitrogen simultaneously
- Advanced crucible technology with automatic ash removal

## Inorganic Elemental Analysis

The innovative inductar® series was developed for easy and accurate analysis of carbon, sulfur, oxygen, nitrogen and hydrogen in inorganic materials. Temperatures up to 3,000 °C are reached by the long-living solid-state induction furnace, which is necessary for the analysis of high melting materials. Thus, together with high performance detectors, accurate and reliable results are guaranteed. Furthermore, customers can enjoy easy sample analysis with high sample throughput.



### inductar® CS cube

- Minimized dust and debris makes tedious cleaning needless
- Advanced crucible design for secure unattended 24/7 operation
- Semi-automated or fully automated sampler with up to 89 positions



### inductar® ONH cube

- First ONH analyzer with a solid-state induction furnace
- Simultaneous analysis of oxygen, nitrogen and hydrogen possible
- Instruments with H-, OH- and ON-only configurations also available



### inductar® EL cube

- World's first 5 element analyzer for the analysis of CS/ONH in inorganic materials
- Sample feeding technology from the top allows the analysis of 5 elements with only one instrument
- Solid-state induction technology for extra-long furnace lifetime

## Optical Emission Spectrometry (OES)

Spark OES is the most reliable and established analytical technique to determine the mass fraction or identification of metals and their alloys. OES analyzers from ELEMENTAR meet the highest requirements of the metal industry, from production control to research and development, from the inspection of incoming or outgoing materials to scrap sorting.



### ferro.lyte®

- For fast, precise metal analysis and on-site identification in laboratory quality
- Revolutionary operation of the software for quick and easy navigation
- Simple reporting thanks to data export at the push of a button
- Precise nitrogen analysis in duplex thanks to innovative CONLYTE® technology (patent pending)

## Software

To compliment our innovative instrumentation, we have created a range of software products offering a brand new user experience whilst working with our instruments. **ArDB** allows scientists to easily compile a database of any analytical result generated by theirs or a colleagues laboratory whilst **ionOS**® offers unparalleled control of our IRMS instruments.



### Make your database work for you with ArDB

**ArDB** makes it simple to construct, maintain and manage a database of analytical results, no matter which technique generated the result. With your results organized and recorded alongside associated sample meta data you can interrogate your data easier than ever before. The powerful capabilities for data visualizations make it simple to discover trends and relationships within your data. The fully integrated multivariate analysis tools, allow databases with a high dimensionality of analytical results to be statistically reduced for easier interpretation.



### The most advanced stable isotope software ever created

**ionOS**® is the most advanced software ever created for the stable isotope community. With the increasing demand on the modern-day laboratory for ever more efficiency, the overhead of processing and evaluating large data sets is an unwelcome requirement. **ionOS** removes these demands saving the analyst time and money whilst generating data more consistently. Designed completely from the ground up and uniquely for stable isotope analysis, **ionOS** provides exceptional automation and sophistication in your EA and GC data processing. **ionOS** delivers unparalleled gains for the entire stable isotope community.



## Stable Isotope Analysis

For more than 40 years, we have been developing and manufacturing Stable Isotope Ratio Mass Spectrometer (IRMS) instruments in Manchester, UK. In conjunction with a comprehensive range of complimentary inlet systems, the IRMS solutions provide high performance measurements of carbon, hydrogen, oxygen, nitrogen and sulfur isotopes in solid, liquid and gaseous samples.

## Stable Isotope Ratio Mass Spectrometers

Our new xION isotope ratio mass spectrometer platform is the smallest 5kV instrument available on the market thanks to the uniquely designed ion optics and integrated **centrION** CF gas handling system. Combined with **ionOS**® software the xION platform combines exceptional analytical performance with powerful automation and intelligence.



### isoprime vision Solutions

- Comprehensive, tailor-made solutions for routine stable isotope analysis
- Smallest IRMS footprint on the market
- Fully automated system setup and performance checks
- **ionOS**® advanced IRMS software



### isoprime precision

- High performance IRMS system with excellent sensitivity, accuracy and precision
- Simultaneous measurement of up to 10 ion beams for multi-collector experiments
- **ionOS**® advanced IRMS software
- Dual Inlet configuration optional

## EA Inlets

Our EA-IRMS solutions are the most technically advanced available and offer innovative technologies for best analysis results. With our unique Advanced Purge and Trap (APT) technology for separating and focussing gas mixtures as well as the zero-blank ball valve sample introduction system, analyses are straightforward, no matter how complex the samples.



### vario ISOTOPE cube

- Industry-leading accuracy and precision thanks to APT technology
- Capable of analyzing materials with a C:S ratio of >5,000:1
- Excellent analysis of large sample sizes up to 30 mg (abs) carbon
- Reliable results, even for low-microgram samples
- Patented ball valve for blank-free sample transfer



### vario ISOTOPE select

- Entry-level elemental analyzer for <sup>15</sup>N, <sup>13</sup>C and <sup>34</sup>S analysis of organic material
- Reliable results for sample sizes up to 7 mg (abs) carbon
- Patented ball valve for blank-free sample transfer
- Tool-free routine maintenance
- Integrated autosampler with up to 240 positions



### vario PYRO cube®

- OH and CNS isotope ratio analysis all in one universal instrument
- Industry-leading accuracy and precision thanks to APT technology
- Matrix-independent, reliable results thanks to patented backflush technology, with exceptional separation of N<sub>2</sub> and CO
- Capable of analyzing materials with a C:S ratio of >5,000:1



### iso TOC®

- Only truly integrated TOC-IRMS system for analysis of dissolved organics
- Eliminates the need for sample extraction and purification
- High temperature combustion of recalcitrant compounds yields 100 % C and N recovery
- Exceptional dissolved organic carbon and bound nitrogen isotope analysis

## Chromatography Inlets

Compound specific isotope analysis is a powerful technique which allows complex mixtures of organic compounds to be separated and then isotopically analyzed. Compound separation is done via GC or LC techniques prior to fractionation-free real-time conversion of the compound to gaseous phase. Our systems offer exceptional sensitivity and chromatography.



### GC5

- Online measurement of  $^{13}\text{C}$ ,  $^{15}\text{N}$ ,  $^2\text{H}$  and  $^{18}\text{O}$  in compounds separated by GC
- Agilent 7890B GC with split/splitless, PTV or on-column injectors
- High temperature  $^2\text{H}$  pyrolysis of compounds at 1,450 °C
- Optimized to maintain chromatographic integrity



### LiquiFace

- Liquid chromatography interface for  $\delta^{13}\text{C}$  measurements
- Fractionation-free wet chemical oxidation at 90 °C
- Direct injection mode for bulk isotope measurements
- Excellent chromatography performance



### iso CHROM<sup>®</sup> LC

- The only LC-IRMS interface to use high-temperature combustion to convert separated compounds to  $\text{CO}_2$
- Robust analysis and significantly improved maintenance intervals
- Exceptional chromatography performance
- Ideal for high throughput LC-IRMS analysis

## Headspace Analysis

Headspace analysis is a technique whereby samples for isotopic analysis are prepared into septum sealed vials or flasks. This includes atmospheric gases, breath, fluids and carbonate materials. These systems perform automated sampling, purification and concentration of the analytical species of interest allowing high precision, high sensitivity analysis of a broad range of sample types.



### iso FLOW

- Headspace analyzer for a broad range of sample matrices
- UltiTrap<sup>™</sup> technology provides dynamic separation of sample gases
- Carrier He flow controlled by a digital high precision MFC
- 180-position heated sample tray with  $\pm 0.1$  °C stability up to 90 °C
- Direct drive pump for precise delivery of acid (optional)



### iso FLOW GHG

- Cryogenic pre-concentration system for analysis of atmospheric concentrations of  $\text{CO}_2$ ,  $\text{N}_2\text{O}$  and  $\text{CH}_4$  greenhouse gases
- Perform high-sensitivity analysis of nitrate via 'bacterial denitrification' technique
- Optional 1,500 °C furnace for  $^{13}\text{C}$  analysis of  $\text{CH}_4$

## Dual Inlet Analysis

Dual inlet technology is the ultimate solution for those applications looking for the highest possible precision and sensitivity for isotope analysis of pure gases. This is due to the unique ultra-low volume change-over valve which performs multiple comparisons between sample and reference gas to drive down analytical precision. Our dual inlet system has the smallest footprint making it an ideal choice for busy laboratories.



### iso DUAL INLET

- High precision pure gas analyzer
- The only dual inlet instrument capable of extremely high precision measurements of carbonate and water samples
- Micro-volume cryogenic cold-finger makes analysis of very small (5  $\mu\text{g}$ ) carbonate samples possible
- The world's highest precision  $^{18}\text{O}$  analysis of water samples
- Extremely compact benchtop system



## Leading in After-Sales Support and Service

Elementar provides complete solutions that incorporate innovation through instrument design benefits. Once installed, ongoing services and qualification as well as technical support and training programs can be provided. In addition, cost-effective consumable kits and parts are readily available.

Because the best possible analysis performance and maximum system uptime increase sample throughput and reduce costs, Elementar supports you with qualified services:

- Technical Customer Service
- System Validation Options
- Customer Training Programs

## Quality you can trust

Our consumables and spare parts are designed to meet the highest quality standards and reliability. They are certified and validated in accordance with international norms and standards. We do not compromise on quality of our parts and chemicals – this is the prerequisite of a guaranteed long lifetime of our instruments.



## Elementar – your partner for excellent elemental analysis

Elementar is the world leader in high performance analysis of organic and inorganic elements. Continuous innovation, creative solutions and comprehensive support form the foundation of the Elementar brand, ensuring our products continue to advance science across agriculture, chemical, environmental, energy, materials and forensics markets in more than 80 countries.

### Elementar Analysensysteme GmbH

Elementar-Straße 1 • 63505 Langenselbold (Germany)

Phone: +49 (0) 6184 9393-0 | [info@elementar.com](mailto:info@elementar.com) | [www.elementar.com](http://www.elementar.com)

