SEAL Analytical

2023 PRODUCT CATALOG

Leading laboratories worldwide choose SEAL systems

Water Testing

Quality Monitoring

Compliance Monitoring

Nutrient Analysis

Sample Preparation

SEAL Analyzers are monitoring environmental samples in every corner of the globe. They are manufactured in the USA, Germany and the Netherlands. With full teams of engineering and chemistry support staff in facilities in Europe, USA and China, laboratories can be sure of the best support, instruments and methods, meeting the latest regulatory requirements. SEAL's global facilities are well supported by a worldwide network of specialist distributors and sales and service centers. Our specialist distributors maintain local stocks of SEAL Analytical parts and have factory trained service staff.

SEAL ANALYTICAL • US

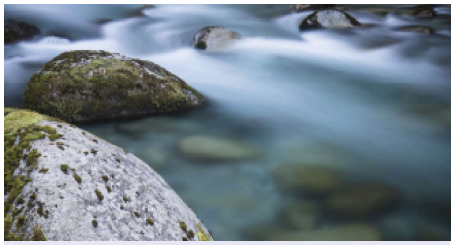
SEAL ANALYTICAL • GERMANY

SEAL ANALYTICAL • NETHERLANDS

SEAL ANALYTICAL • UK

SEAL ANALYTICAL • CHINA

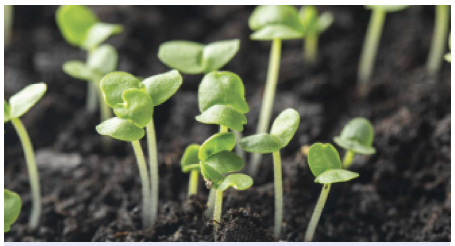
This is What Makes SEAL Different



WATER

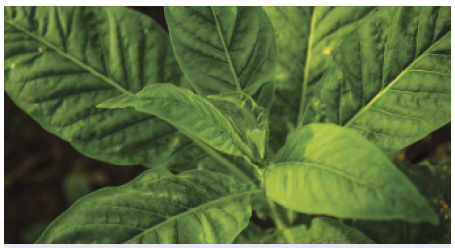
WASTEWATER

SEAWATER



SOILS & PLANTS

FERTILIZER



TOBACCO

SEAL prides itself on designing, manufacturing and supporting the best analyzers, sample preparation and robotic equipment. For many of our thousands of customers around the globe this is no secret. But there are many other differences that make SEAL what it is, some of these well-known and others less so. We have identified what sets SEAL apart and what drives our business to deliver you safer, smarter and more dependable solutions.

Experience

SEAL has over 50 years experience in designing and manufacturing environmental and industrial automated analyzers.

Strong Engineering Capabilities

An ongoing commitment to building and maintaining strong internal engineering capabilities either through acquisition of key technologies or R&D internally.

Inhouse Expertise

The depth of knowledge and end-to-end quality control achieved with our in-house technical team of chemists, engineers and software programmers sets us apart from all others in the industry.

Focused on Integrity and Trust

We operate with the highest integrity and focus on building strong customer relationships; in many cases we have spent decades as a trusted supplier. This trust is built on listening, understanding and delivering the highest quality products and solutions.

Just Environmental and Industrial Samples

SEAL analyzers are widely acknowledged as the best-in-class and instrument of choice for monitoring nutrients in water and wastewater, seawater, soils and plant materials, as well as the quality control of industrial products, fertilizers and tobacco.

Products that solve your problems

Our product development always starts with you, our customer. Understanding and addressing the pain points in a modern laboratory not only drives our product development it also drives our business acquisition of industry leading, proven technologies. Understanding your needs means we're developing products that are smaller, more automated, more reliable and better for the environment.

Quality Emphasis

We have invested heavily in ensuring our business and manufacturing processes meet or exceed quality standards. We are proud to have received external acknowledgement of our quality emphasis with ISO 14001 and ISO 9001 accreditation.

DISCRETE ANALYZERS

TP NO_2 NH_3 SO 4 CrVI
TKN Fe NO_3 Cl
SiO_2 PO_4

THE MOST POPULAR AND VERSATILE ANALYZERS

A SEAL Discrete nutrient analyzer completely automates your manual wet chemistry methods, mimicking the operation of a laboratory chemist and adding the ability to measure multiple analytes simultaneously. With true walk away operation including automatic standard preparation, automatic pre- and post-dilution and automatic spiking capabilities, a SEAL discrete analyzer is ideal for laboratories requiring high levels of automation and a wide range of chemistries.

METHODS INCLUDE

- **Alkalinity**
- **Ammonia**
- **Chloride**
- **Cyanide**
- **Nitrate/Nitrite**
- **Nitrite**
- **Phenol**
- **Phosphate, ortho**
- **Phosphorus, total**
- **Silicate**
- **Sulfate**
- **Total Kjeldahl Nitrogen**

PLUS MANY MORE

Features

Multiple Methods
Multiple chemistry parameters on a single sample in any order and without operator intervention. SEAL provides method procedures specific to wastewater applications.

No Cross Contamination
The only discrete analyzer with integrated probe washer. Eliminates cross contamination between reagents and samples.

Integrated Cadmium Coil
The Cadmium reduction method is the most widely accepted nitrate+nitrite test method. Software automatically switches the coil inline and includes in-situ regeneration.

All four EPA approved nitrate+nitrite chemistries can be run, allowing your lab flexibility and options.

Simplified Waste Disposal
Segregated chemical and wash waste minimizes hazardous waste disposal costs. Easy to access and outside of instrument.

Compact Design
The compact, enclosed, bench-top design allows for easy visual checks during operation and does not require a fume hood.

AQ300
Compact bench-top analyzer.

AQ400
High speed, automation and detection levels.

AQ700
Highest throughput and speed, automation and detection levels.

The right technology to completely replace your manual methods and deliver superior results.

NO CROSS CONTAMINATION
The only discrete analyzer with integrated probe washer. Eliminates cross contamination between reagents and samples. Keeps the probe free of reagents, oil and grease. Ideal for wastewater.

COMPACT DESIGN
Compact, enclosed, bench-top design allows for easy visual checks during operation and does not require a fume hood.

INTEGRATED OPTICALLY PURE CUVETTE
10 mm pathlength or longer for maximum sensitivity and lower detection levels. Optical glass is superior to styrene for sample analysis ensuring highest precision.

USEPA, ASTM, ISO APPROVED METHODS
Also complies with other international regulatory methods.

COMPLETE REACTION
Constant heating and programmable reaction time for a highly controlled reaction. This means the reaction is brought to completion increasing precision and accuracy of test results.

MULTIPLE METHODS
Up to 14 chemistry parameters on a single sample in any order and without operator intervention.

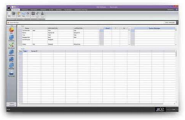
EFFECTIVE SAMPLE & REAGENT MIXING
Reproducible results thanks to sample and reagent mixing that approximates manual mixing in a flask.

SIMPLIFIED WASTE DISPOSAL
Segregated chemical and wash waste minimizes hazardous waste disposal costs. Easy to access and outside of instrument.

DISPOSABLE REACTION WELLS
Inexpensive, disposable wells that reduce carryover and cost per test.

REAGENT WEDGES
With onboard cooling; built-in level sensor to verify reagent volume required for each test.

LOWER DETECTION LEVELS
Critical for environmental applications, lowest possible detection levels are a priority. This is made possible with the right combination of mixing technique, longer path length, optically pure detection, accurate dispensing and completion of chemical reaction.



LIMS READY
Customizable output for easy integration.

FAST, ON-DEMAND ANALYSIS
Easy, rapid colorimetric testing with minimal start-up time.

MINIMAL MOVING PARTS
Less maintenance and a more robust analyzer.

REDUCED REAGENT CONSUMPTION & WASTE GENERATION
Uses only µL dispenses of reagents and samples to greatly reduce the amount of chemical used and waste generated with each test.

REMOVABLE SAMPLE TRAY
Allows pre-loading of sample. Interchangeable for optional larger vial.

INTEGRATED CADMIUM COIL
Allows flexibility in nitrate+nitrite testing. Software automatically switches the coil inline with easy in-situ regeneration.

Designed by chemists **for chemists.**

SEGMENTED FLOW ANALYZERS

AUTOANALYZERS FOR ENVIRONMENTAL ANALYSIS

Ideal for laboratories requiring high throughput, high reproducibility and low detection limits, SEAL's segmented flow analyzers (SFA) are state of the art nutrient analyzers. Systems are customizable to fit all workloads and method needs. Perfectly suited for standard chemistries as well as inline sample preparation including dialysis and UV digestion.

APPLICATIONS INCLUDE

- **Seawater**
- **Water and Wastewater**
- **Drinking Water**
- **Fertilizer**
- **Soil and plants**
- **Tobacco**
- **Wine/Beer**
- **Animal Feed**

Not all features available on all models.

Total Automation

SEAL SFA systems are capable of full digital control of heaters, distillation, digestion, air injection and reagents. The AA500 and QuAAtro are capable of total automation including automatic start-up and shut-down for true set and leave operation.

Multi-Test Chemistry Manifolds

SEAL SFA systems can include multi-test chemistry manifolds. These allow flexibility in your testing so that each channel is not dedicated to one chemistry and what you test on the system can vary from one run to the next.

Dialysis

Dialyzers can remove interference from sample color or extraction solution plus extend the analytical range. The sample is passed over a dialyzer membrane and the analyte of interest is passed into a carrier solution eliminating background color and interferences from extraction solutions.

In-Line UV Digestion

SEAL segmented flow analyzers can perform UV assisted persulfate digestion automatically within the chemistry module. This digestion is suitable for TN or TP and a multi-test option is available for TP and TN to be run in series.

In-Line Distillation

For the measurement of analytes including phenol and free, WAD and total cyanide. The distillation heating unit and coils are built into the chemistry manifold making these analyses much more compact and simpler to run.

Gas diffusion

Gas diffusion manifolds can be used for analyzing chemistries such as ammonia,eliminating sample analysis issues due to differing salinities and pH. This ensures reproducible, reliable results.

Featuring Innovative & Intelligent Technologies

- **New, all-in-one housing design is both compact and modular**
- **True automatic startup and shutdown with pump platen engage and release**
- **Automatic standard preparation and auto dilution**
- **Ultra-low detection limits**
- **Multi-test manifolds for different nutrients with no hardware changes**
- **Easy reagent management with auto level sensing**

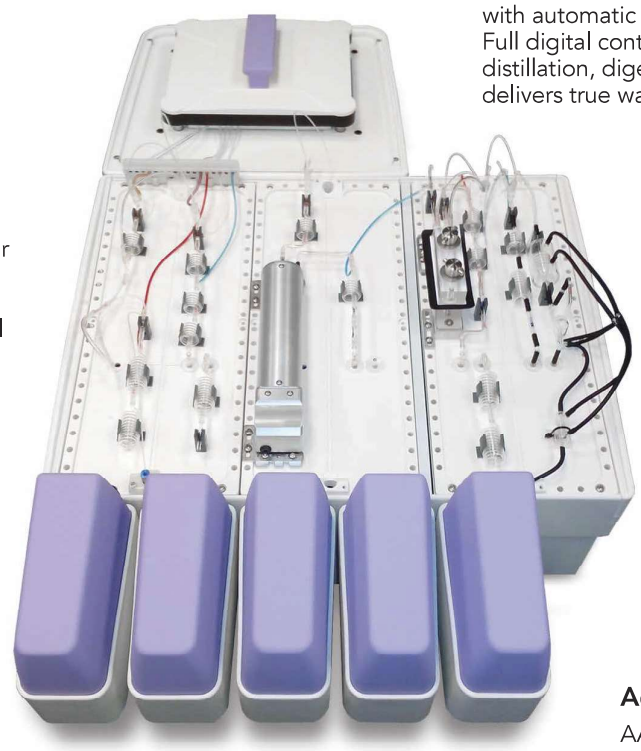
Systems to fit all workloads

AA500

Flexible analyzer for varying workloads

Total Automation

True auto startup and auto shutdown is now possible with automatic pump platen engage and release. Full digital control of reagent valves, heating coils, distillation, digestion, air injection and reagents, delivers true walk away operation.



Modular & Compact

The all-in-one housing, uses modular components to deliver a compact analyzer with more organization, more integration and more powerful control, all while using less bench space. System modules can be standalone or used to replace AA3 modules.

High Performance Chemistry Module

The chemistry manifold uses an easy fix system to position precision glass components. Glass is chemically inert and enables quick, easy visual checks and cleaning. Distillation, gas diffusion, dialysis and UV digestion can also be incorporated. Optional multitest manifolds available for quick method changeover.

High Resolution Digital Photometer

The high resolution dual beam LED digital photometer delivers long life, low maintenance, and the lowest detection levels, even in extreme environments. Optional LED wavelength modules 250nm - 880nm. Optional 10 - 50mm flow cells.

Advanced Sampling

AA500 Samplers are fast, robust and available with various rack sizes to meet your sample requirements. Samples can be added at any time during the run.

AA100

Economical analyzer for small laboratories

The single or dual channel AA100 is ideal for all types of water analysis for laboratories needing a simple, uncomplicated system to run 1 or 2 dedicated chemistries. The AA100 is also available for specialty methods like ammonia with gas diffusion or inline distillation for Cyanide or Phenol.

QuAAtro39

High capacity nutrient analyzer

This high performance micro flow chemistry analyzer is ideal for high throughput laboratories. With micro flow hydraulics, heated manifolds, high resolution detectors and advanced software, it is used for the detection of nutrients in water, wastewater, seawater, soil, plant extracts, tobacco and wine. Available with auto startup, auto method changeover and auto shutdown including valve/ reagent washout and automatic pump platen release option for true automation.

ROBOTIC HANDLING SYSTEMS

Conductivity BOD Clay Fraction Alkalinity Turbidity pH COD Methanol Extraction

ADVANCED LABORATORY AUTOMATION

The SEAL MiniLab series includes a robotic platform for every size laboratory and workload. With its compact benchtop design, the MiniLab employs robotic arms to precisely and automatically perform sample preparation steps in routine analysis.

Unique to the SEAL system is the ability to select from a range of MiniLab models that automate part or all of your sample preparation steps. You choose the level of robotics, automation and throughput that suits your laboratory. All MiniLab models come in a range of sizes, so now there is a robotic solution for every lab and budget.

The MiniLab was designed for reliable "walk-away" operation. Integration with your LIMS ensures simple import and export of sample ID's, procedures and preferences. The intuitive versatile software allows analysts to easily set-up a run based on preset templates.

ADVANTAGES INCLUDE

- **Automated sample pre-treatment and analysis in a single unit**
- **Flexible to suit every lab and application**
- **Precision robotics for perfect alignment**
- **Robust construction and reliable operation**
- **Easy to use and easy to maintain**
- **In-house software development for a close feedback loop**

MiniLab AR & AP Series

SEAL's MiniLab AR & AP series is suitable for any size space and workload. Lower your cost per sample by reducing sample turn-around time, improving accuracy of results, eliminating errors and operator/sample interaction and minimizing downtime.

The **MiniLab AR –** AutoRead station is your solution for the automated reading of various parameters such as pH & EC and is compatible with most meters and probes. Sample racks are available for a wide variety of sample vials and bottles – from volumes of 10 ml to more than 1 liter.

The **MiniLab AP –** AutoPrep station can be used standalone as an automated preparation unit or as a modular upgrade to the MiniLab AR. It is ideal for providing a parent sample bottle with aliquots taken and diluted into vials on the MiniLab AR.

Biochemical Oxygen Demand (BOD)

Often a tedious and repetitive process, Biochemical Oxygen Demand (BOD) automation is a necessity in modern environmental labs. The MiniLab Robotics BOD Series ranges from compact models with 12 bottle capacity to larger custom models handling thousands of bottles per day. Correct alignment is ensured while accurately performing the specified automated function. The SEAL BOD software is fully customizable so your laboratory needs and regional regulations can be met.

AUTOMATION OPTIONS

- **Barcode reading, bottle capping/de-capping**
- **Sample pipetting, pre-dilutions,**
- **pH measurement and adjusting pH**
- **Addition of the nitrification inhibitor (ATU) and/or seed**
- **Sample aeration and sample homogenization**
- **Measurement of dissolved oxygen**
- **Optical probes for fast stabilization**

Multi-Parameter

The Multi-parameter MiniLab can be configured to prepare and automate a range of analytical parameters – all in one system. Ideal for water and soil applications, systems range from a simple single parameter unit, such as pH, to a multi probe unit designed to measure many parameters. These can include sample preparation features such as sample splitting and filtration. The MiniLab is compatible with many current meters, probe types and titration systems.

Automate one or more of the following parameters:

Alkalinity • **pH** • **Conductivity** • **Turbidity** • **Color** • **Hardness** • **BOD** • **COD**

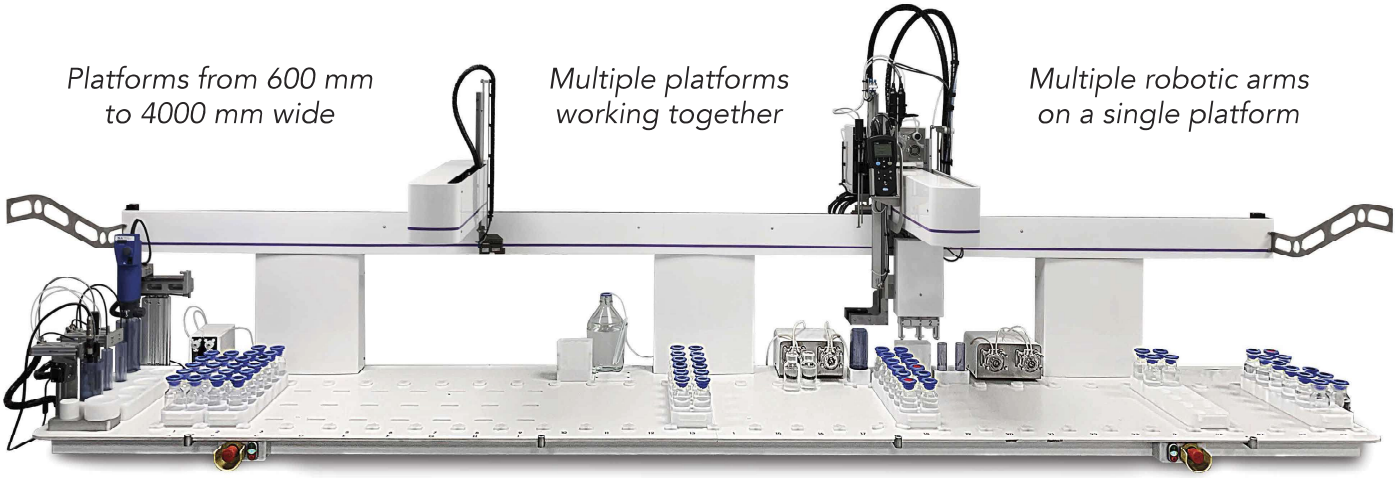
MiniLab ML Series

The **MiniLab ML** series provides complete automation of even the most complex sample preparation steps, including picking up bottles, reading barcodes, sample splitting, filtering, dispensing of reagents, stirring, weighing, decapping and capping, crimping and more – giving you true "walk-away" operation.

Platforms from 600 mm to 4000 mm wide

Multiple platforms working together

Multiple robotic arms on a single platform



DIGESTION SYSTEMS

IMPROVED DIGESTIONS RESULT IN BETTER ANALYSIS

SEAL has many different ways to simplify the sample digestion process depending on the level of automation required and the digest temperature.

BD50 & BD28 *Programmable High Temperature Digestion System*

The BD50s and BD28s Programmable Digestion Systems perform acid digestion of samples under controlled conditions and are available in two different formats:

- **28 place for 250ml digestion tubes**
- **50 place for both 75ml and 100ml digestion tubes**

Designed for durability and robustness, a BD50s/BD28s digestion system includes a block digestion unit, programmable controller, tube rack/draftshield, digestion tubes and an optional cooling stand that supports the tube rack above the block. Ideal for applications such as Total Kjeldahl Nitrogen (TKN) and Phosphorous (TKP), the unique heating element provides even heating throughout the solid aluminum block ensuring reproducible digestions. If you are looking to automate your digestions, the BD50s and BD28s offers enhanced productivity, better quality digestions and increased safety.

DEENA 4 *Automated Metals Digestion and Sample Preparation*

DEENA 4 is ideal for trace metals and fully automating the digestion process ensuring each sample is treated exactly the same, safeguarding against human error. DEENA 4 significantly increases laboratory safety by eliminating the manual dispensing of corrosive acids and other dangerous reagents.

- **Accurately dispense small volumes of reagents**
- **Mix thoroughly**
- **Heat to 300°C**
- **Fill to volume after digestion is completed**
- **Eliminate cross-contamination**

Suitable for EPA Approved Methods: 3005, 3010, 3050A, 3050B, 200.2, 200.7, 200.8, 7470A, 7471A, 245.1, 1631, 245.7 and more!

SmartBlock II *Manual Metals Digestion*

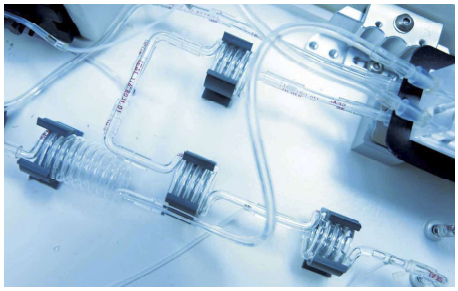
Compact, easy-to-use heating block, ideal for digestion samples for trace metals, TN, TP. The rugged Teflon coating resists highly corrosive acids making your digestion safer. SmartBlock II with inbuilt programmable controller can significantly reduce sample volume, chemicals and digestion time making your digestion easier, more reproducible and more efficient. Take the digestion tubes straight from the SmartBlock to your ICP or other analyzer.

SEAL LABORATORY SUPPLIES

Genuine SEAL parts for optimum performance

For any instrument, long-term reliability and reproducibility depends on regular maintenance and using quality parts. SEAL simplifies this process by offering high quality, genuine parts and consumables directly from our locally stocked warehouses for your SEAL instruments and other laboratory systems. SEAL offers specialized kits to make ordering and maintenance simple.

Join our Autoship Program *Save time and money and never run out of supplies again!*

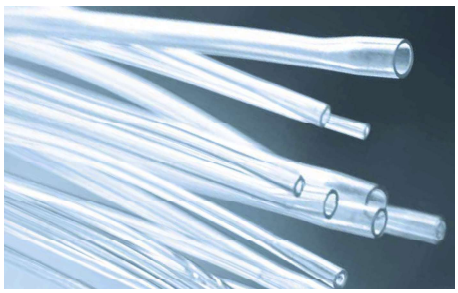


Continuous Flow Analyzers

To guarantee best performance, best reproducibility and lowest detection limits, always use SEAL flow rated pump tubing on your segmented flow analyzer. Specialist glass pieces, flow cells, sample cups, specialized parts for inline sample preparation including UV lamps, dialyzer membranes and patented heat coils for current and older models of analyzers are available.

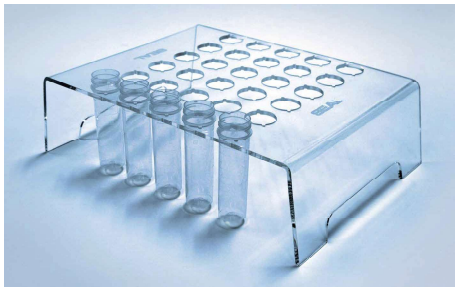
Discrete Analyzers

Along with sample cups, reagent wedges and reaction segments, SEAL maintains an inventory of cadmium coils for nitrate reduction, probe wash assemblies, probes, syringes, lamps and other specialized spares parts. The 3, 6 and 12 months kits make regular maintenance simple and will help keep your analyzer in shape for years to come.



Flared Pump Tubing for ICP

Flared end pump tubing makes connecting your small ID tubing to larger tubing simple! No more frustrating time wasting. SEAL can supply flared end tubing for any size and material. Ideal for ICP/ICP-MS applications. Any pump tubing type can be supplied with flared ends; including both 2-shoulder and 3-shoulder tubing types. Call us for free samples.



Other Supplies

SEAL Lab Supplies offers a wide range of consumables for digestion, sample preparation, chromatography and spectroscopy applications. From plastic and glass sample vials, specialist glassware, teardrop stoppers and reflux caps, SEAL has you covered.

SEAL LAB SUPPLIES

See our website for a listing of our common parts or contact us to inquire about our auto-ship program.

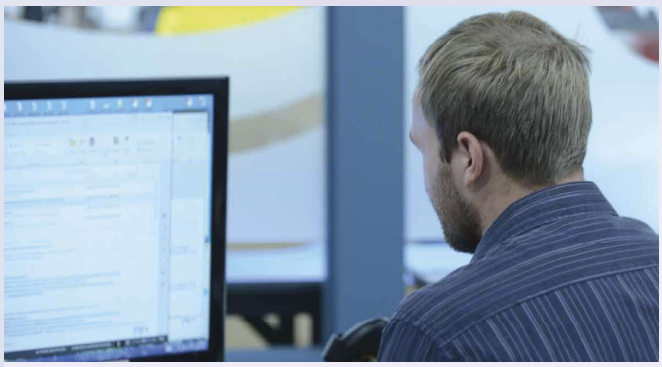
www.seal-analytical.com

Experience SEAL Analytical

At SEAL Analytical we focus on one thing — the best analytical and sample preparation solutions for environmental and industrial samples. You've never experienced peace of mind until you've discovered the SEAL Analytical ownership experience.

We want you to have a faster return on your investment by improving your laboratory productivity and helping you utilize the capabilities of your SEAL solutions. For this reason we have designed an ownership experience that includes everything from the essential initial training, to maximizing your uptime, helping you maintain regulatory compliance, keeping you running smoothly, and one-on-one support from in-house chemistry experts when you need it. Peace of mind starts with SEAL Analytical.

Technical support from in-house chemistry experts, when and where you need it.



Software developed and maintained in-house.

In-house applications and product development for keeping you up-to-date and regulatory compliant.

Spares and consumable stocks located close to you and dispatched same day.

SEAL Analytical

Tecnilab

TECNILAB AV PORTUGAL, S.A.

Sede: Rua Gregório Lopes LT 1512 B, 1449 - 041 Lisboa Portugal | Tel.: 21 722 08 70 | geral@tecnilab.pt

Filial: Travessa Monte da Bela 48, 4445 - 294 Ermesinde Portugal | Tel.: 22 906 92 50 | porto@tecnilab.pt

www.tecnilab.pt