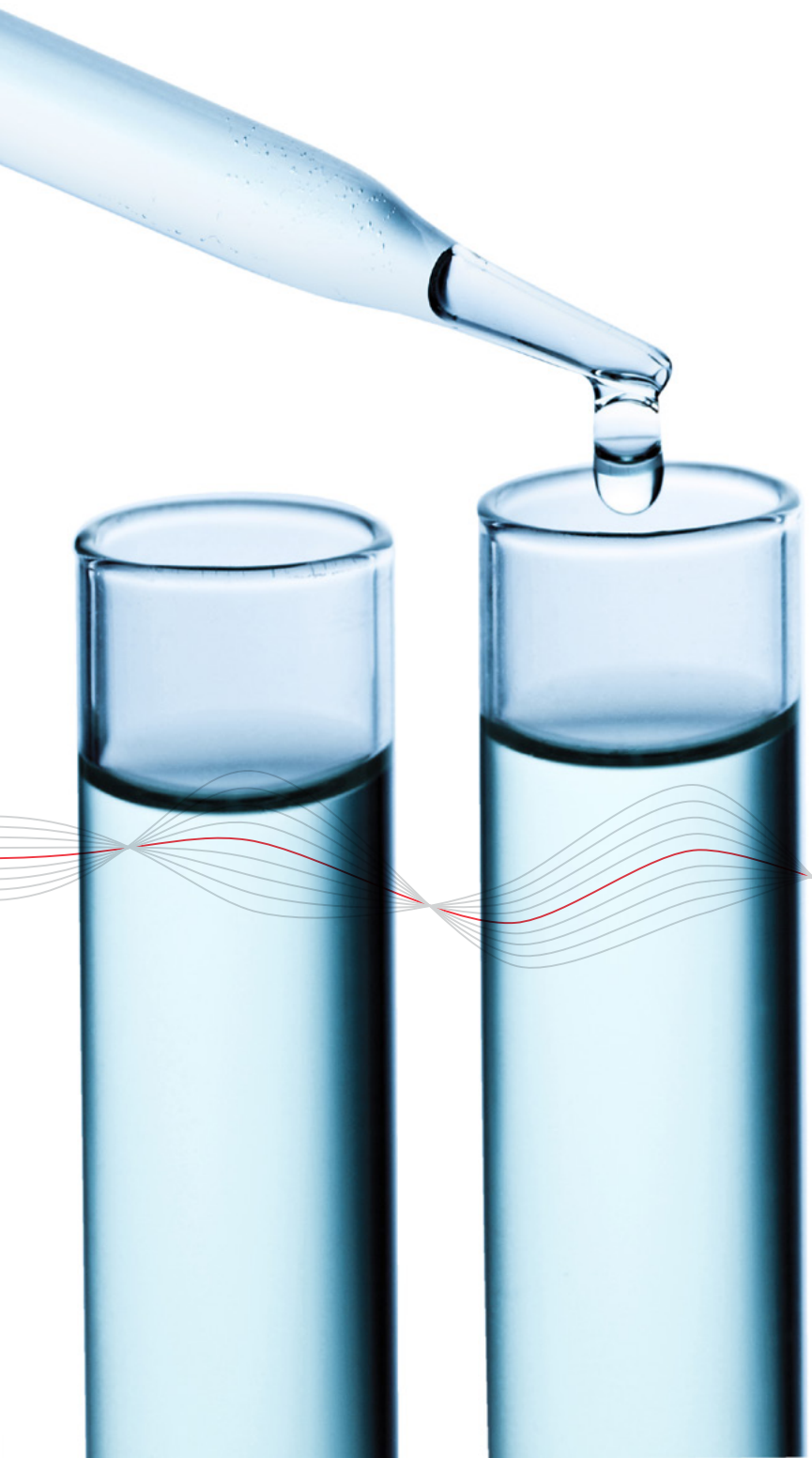

# Environmental & industrial applications compendium

## Gallery Discrete Analyzer

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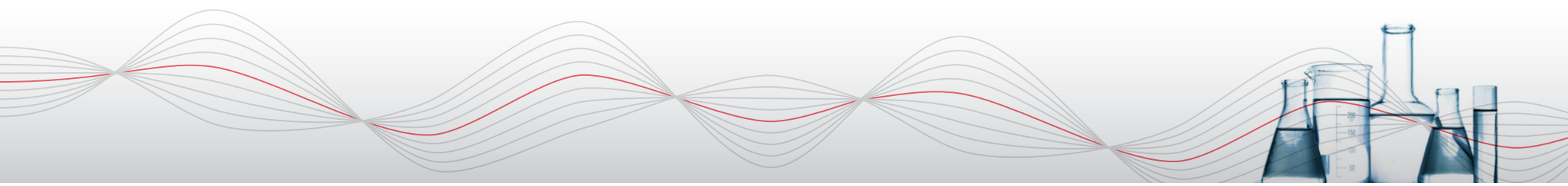


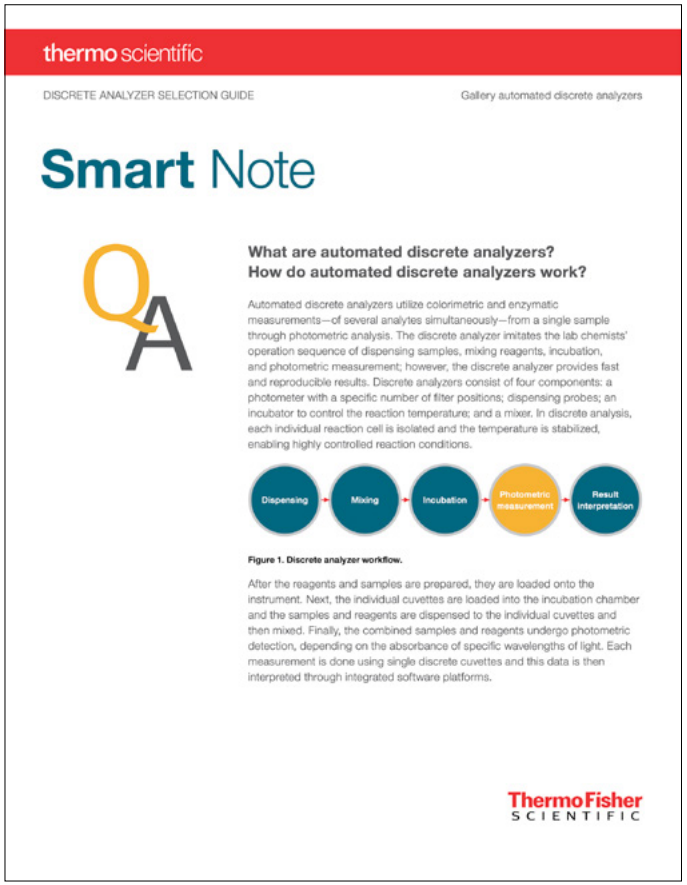
# Table of contents

# What are automated discrete analyzers?
# How do automated discrete analyzers work?

**Overview**

Automated discrete analyzers utilize colorimetric and enzymatic measurements from a single sample through photometric analysis. The discrete analyzer imitates the lab chemists' operation sequence of dispensing samples, mixing reagents, incubation, and photometric measurement. The discrete analyzer provides fast and reproducible results. In discrete analysis, each individual reaction cell is isolated and the temperature is stabilized, enabling highly controlled reaction conditions.

This smart note introduces you to automated discrete analyzer technology and how it functions.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DISCRETE ANALYZER SELECTION GUIDE

Gallery automated discrete analyzers

Smart Note

What are automated discrete analyzers?
How do automated discrete analyzers work?

Automated discrete analyzers utilize colorimetric and enzymatic measurements—of several analytes simultaneously—from a single sample through photometric analysis. The discrete analyzer imitates the lab chemists' operation sequence of dispensing samples, mixing reagents, incubation, and photometric measurement; however, the discrete analyzer provides fast and reproducible results. Discrete analyzers consist of four components: a photometer with a specific number of filter positions; dispensing probes; an incubator to control the reaction temperature; and a mixer. In discrete analysis, each individual reaction cell is isolated and the temperature is stabilized, enabling highly controlled reaction conditions.



Figure 1. Discrete analyzer workflow.

After the reagents and samples are prepared, they are loaded onto the instrument. Next, the individual cuvettes are loaded into the incubation chamber and the samples and reagents are dispensed to the individual cuvettes and then mixed. Finally, the combined samples and reagents undergo photometric detection, depending on the absorbance of specific wavelengths of light. Each measurement is done using single discrete cuvettes and this data is then interpreted through integrated software platforms.

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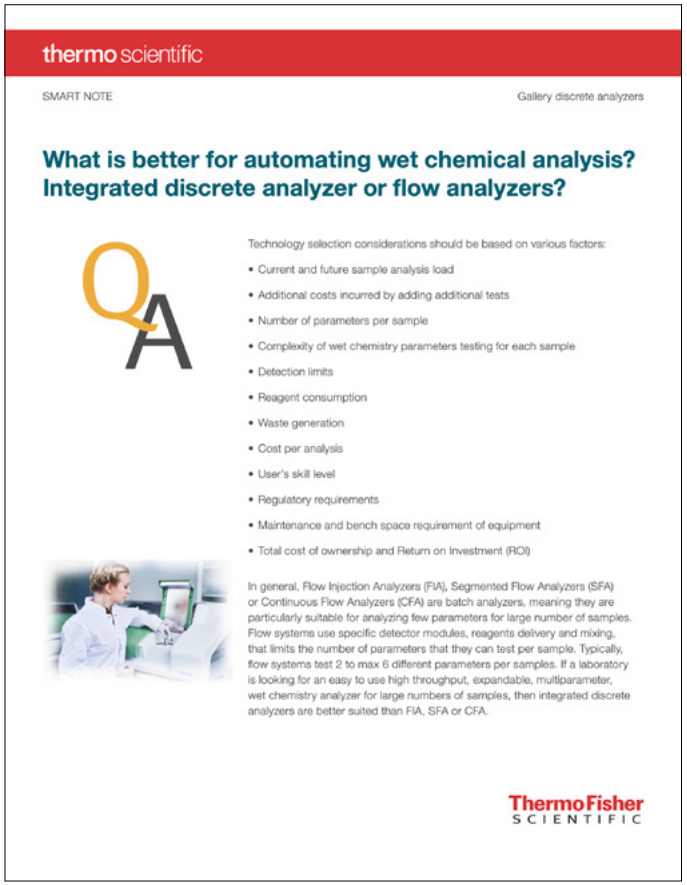
# What is better for automating wet chemical analysis? Integrated discrete analyzer or flow analyzers?

## Overview

In general, Flow Injection Analyzers (FIA), Segmented Flow Analyzers (SFA) or Continuous Flow Analyzers (CFA) are batch analyzers, meaning they are particularly suitable for analyzing a few parameters for a large number of samples. Flow systems use specific detector modules, reagents delivery and mixing, which limits the number of parameters that they can test per sample. Typically, flow systems test 2 to 6 maximum different parameters per sample. If a laboratory is looking for an easy-to-use, high throughput, expandable, multiparameter, wet chemistry analyzer for large numbers of samples, then integrated discrete analyzers are better suited than FIA, SFA or CFA.

This smart note provides detailed comparisons between the different technologies, and walks you through the advantages of each technology.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SMART NOTE

Gallery discrete analyzers

What is better for automating wet chemical analysis? Integrated discrete analyzer or flow analyzers?

Technology selection considerations should be based on various factors:

- Current and future sample analysis load
- Additional costs incurred by adding additional tests
- Number of parameters per sample
- Complexity of wet chemistry parameters testing for each sample
- Detection limits
- Reagent consumption
- Waste generation
- Cost per analysis
- User's skill level
- Regulatory requirements
- Maintenance and bench space requirement of equipment
- Total cost of ownership and Return on Investment (ROI)

In general, Flow Injection Analyzers (FIA), Segmented Flow Analyzers (SFA) or Continuous Flow Analyzers (CFA) are batch analyzers, meaning they are particularly suitable for analyzing few parameters for large number of samples. Flow systems use specific detector modules, reagents delivery and mixing, that limits the number of parameters that they can test per sample. Typically, flow systems test 2 to max 6 different parameters per samples. If a laboratory is looking for an easy to use high throughput, expandable, multiparameter, wet chemistry analyzer for large numbers of samples, then integrated discrete analyzers are better suited than FIA, SFA or CFA.

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# Easy, fast, and simultaneous pH and conductivity measurements

## Overview

pH and conductivity measurements provide crucial insights for a variety of industries, including the food and beverage, industrial process, enzyme kinetics and water analysis sectors. Fast, accurate and cost-effective pH and conductivity measurement workflows create the stream of regular, meaningful data that drives important decisions. By regularly testing all parameters of a manufacturing line, process problems are detected early, enabling intervention and improvements that protect equipment, product consistency and quality standards. In turn, the collection of accurate and timely data provides evidence for regulatory approval and audit submissions.

This brochure discusses how the integrated electrochemical measurement (ECM) module in Gallery discrete analyzers provides parallel, automated electrochemical measurement of pH and conductivity along with complete photometric testing.

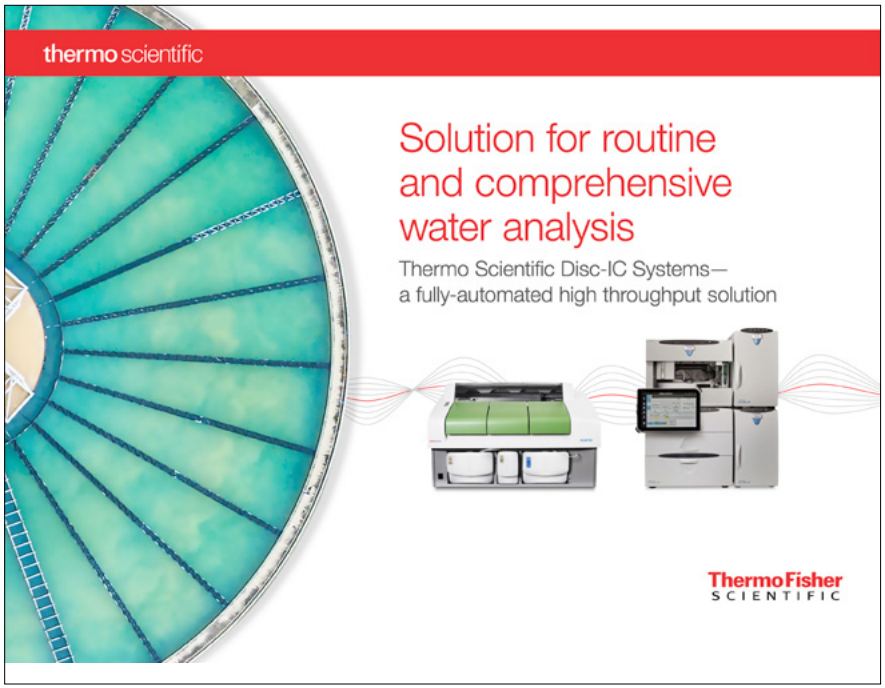

View the full brochure

# Solution for routine and comprehensive water analysis

## Overview

Process water quality is an integral part of the industrial manufacturing process. Multi-component analysis of corrosive ions, scaling ions, corrosion inhibitors, and corrosion indicators provides detailed information for successful and predictable unit operations. Routine testing of water samples for multiple analytes increases the overall sample testing demand on utilities and central laboratories.

This brochure summarizes how Thermo Scientific™ discrete analyzers and ion chromatography (IC) systems can offer rapid multiparameter testing, unattended high throughput analysis of large sample numbers, and cover a wide concentration range for sample types of varying ionic strengths for industrial process water quality monitoring. Together, discrete analysis and IC solve a majority of water analysis needs for improved productivity and reliability.

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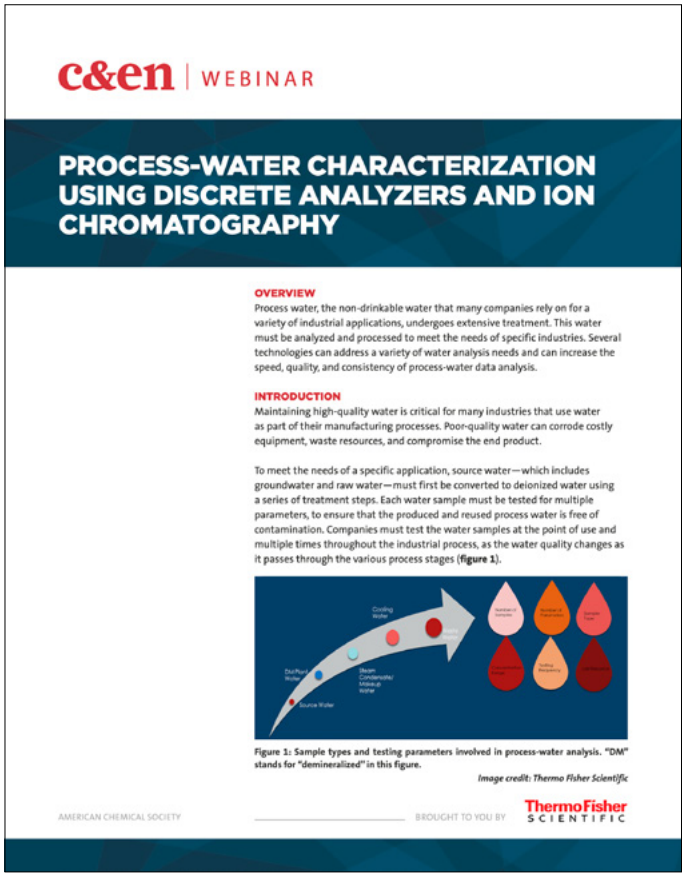
# C&EN webinar: Process-water characterization using discrete analyzers and ion chromatography

## Overview

Process water, the non-drinkable water that many companies rely on for a variety of industrial applications, undergoes extensive treatment. This water must be analyzed and processed to meet the needs of specific industries.

Process-water analysis can be challenging. This C&EN executive summary provides an overview of the appropriate instruments and methods to address those challenges. The Gallery discrete analyzer provides routine, high-throughput analysis for many parameters of interest, including pH, conductivity, and concentration, and can achieve up to ppb levels of detection and does not require skilled operators. It is a “walkaway” solution for many water analysis needs.

While the discrete analyzer platform is suitable for a wide range of user needs, those who require a comprehensive solution for water analyses should consider also incorporating a Thermo Scientific™ Dionex™ ion chromatography (IC) system into their lab, which can characterize a much broader range of anions and cations and achieve up to ppt levels of detection. IC can also help minimize signal interference from a sample matrix.


c&en | WEBINAR

PROCESS-WATER CHARACTERIZATION USING DISCRETE ANALYZERS AND ION CHROMATOGRAPHY

OVERVIEW

Process water, the non-drinkable water that many companies rely on for a variety of industrial applications, undergoes extensive treatment. This water must be analyzed and processed to meet the needs of specific industries. Several technologies can address a variety of water analysis needs and can increase the speed, quality, and consistency of process-water data analysis.

INTRODUCTION

Maintaining high-quality water is critical for many industries that use water as part of their manufacturing processes. Poor-quality water can corrode costly equipment, waste resources, and compromise the end product.

To meet the needs of a specific application, source water—which includes groundwater and raw water—must first be converted to deionized water using a series of treatment steps. Each water sample must be tested for multiple parameters, to ensure that the produced and reused process water is free of contamination. Companies must test the water samples at the point of use and multiple times throughout the industrial process, as the water quality changes as it passes through the various process stages (**figure 1**).

Figure 1: Sample types and testing parameters involved in process-water analysis. “DM” stands for “demineralized” in this figure.

*Image credit: Thermo Fisher Scientific*

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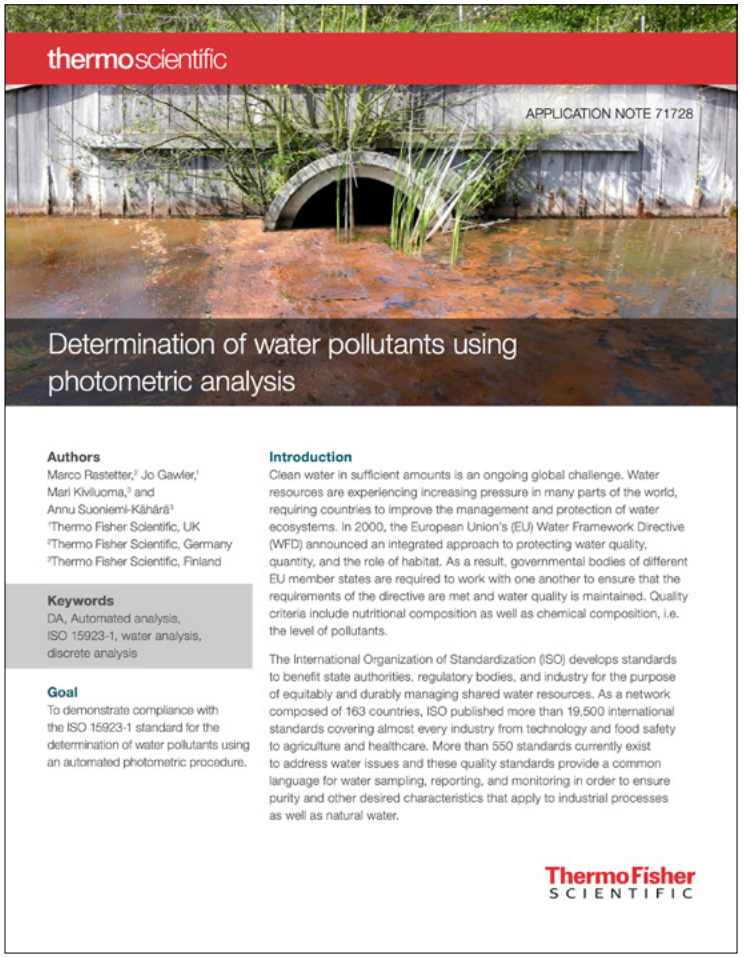
View the full executive summary

# Determination of water pollutants using photometric analysis

## Overview

The International Organization of Standardization (ISO) has published more than 550 standards to address water issues, which provide a common language for water sampling, reporting, and monitoring in order to ensure purity and other desired characteristics that apply to industrial processes as well as natural water.

In this study, the methods and performance of Thermo Scientific™ discrete analyzers are described according to the analysis guidelines of ISO 15923-1. All data is generated using the automated Gallery discrete analyzers and Thermo Scientific™ system reagents for applications via photometric and enzymatic analysis.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APPLICATION NOTE 71728

Determination of water pollutants using photometric analysis

**Authors**

Marco Rastetter,[2] Jo Gawler,[1] Mari Kiviluoma,[3] and Annu Suoniemi-Kähärä[3]

[1]Thermo Fisher Scientific, UK
[2]Thermo Fisher Scientific, Germany
[3]Thermo Fisher Scientific, Finland

**Keywords**

DA, Automated analysis, ISO 15923-1, water analysis, discrete analysis

**Goal**

To demonstrate compliance with the ISO 15923-1 standard for the determination of water pollutants using an automated photometric procedure.

**Introduction**

Clean water in sufficient amounts is an ongoing global challenge. Water resources are experiencing increasing pressure in many parts of the world, requiring countries to improve the management and protection of water ecosystems. In 2000, the European Union's (EU) Water Framework Directive (WFD) announced an integrated approach to protecting water quality, quantity, and the role of habitat. As a result, governmental bodies of different EU member states are required to work with one another to ensure that the requirements of the directive are met and water quality is maintained. Quality criteria include nutritional composition as well as chemical composition, i.e. the level of pollutants.

The International Organization of Standardization (ISO) develops standards to benefit state authorities, regulatory bodies, and industry for the purpose of equitably and durably managing shared water resources. As a network composed of 163 countries, ISO published more than 19,500 international standards covering almost every industry from technology and food safety to agriculture and healthcare. More than 550 standards currently exist to address water issues and these quality standards provide a common language for water sampling, reporting, and monitoring in order to ensure purity and other desired characteristics that apply to industrial processes as well as natural water.

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View the full application note

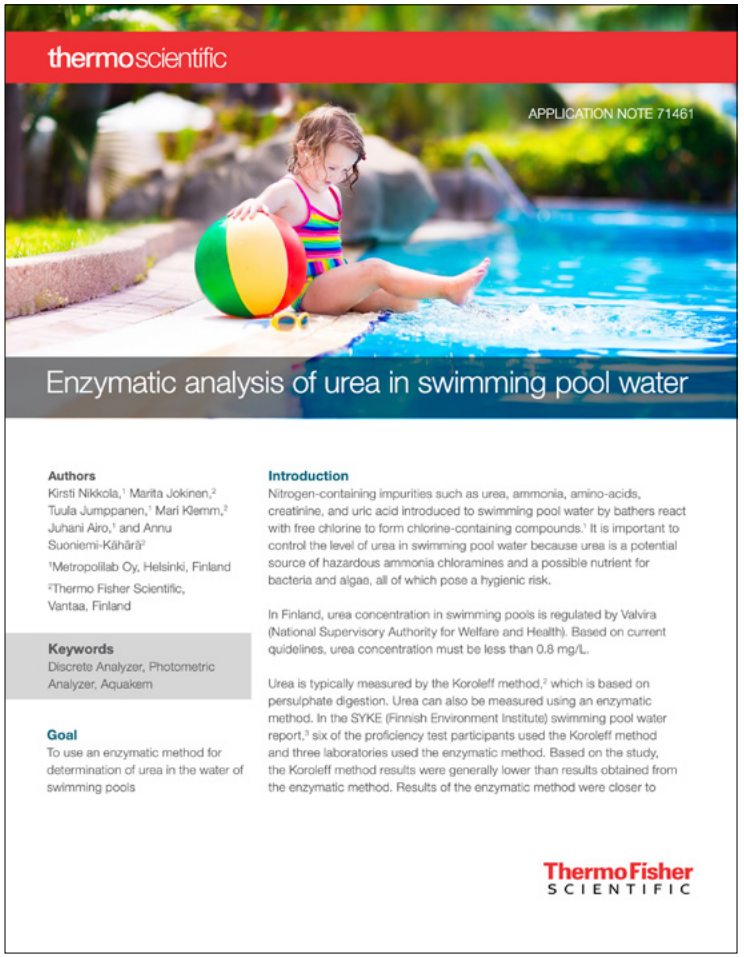
# Enzymatic analysis of urea in swimming pool water

## Overview

Nitrogen-containing impurities such as urea, ammonia, amino-acids, creatinine, and uric acid introduced to swimming pool water by bathers react with free chlorine to form chlorine-containing compounds. It is important to control the level of urea in swimming pool water, as urea is a potential source of hazardous ammonia chloramines and a possible nutrient for bacteria and algae, all of which pose a hygienic risk.

Urea is typically measured by the Koroleff method, which is based on persulphate digestion. Urea can also be measured using an enzymatic method using the Thermo Scientific discrete analyzers. In the SYKE (Finnish Environment Institute) swimming pool water report, six of the proficiency test participants used the Koroleff method and three laboratories used the enzymatic method.

This application note demonstrates that the Koroleff method results were generally lower than results obtained from the enzymatic method. Results of the enzymatic method were closer to calculated results of the proficiency test samples. By switching from the Koroleff method to the enzymatic method, the result levels are expected to be more accurate and therefore higher than previously reported results.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APPLICATION NOTE 71461

Enzymatic analysis of urea in swimming pool water

**Authors**

Kirsti Nikkola,[1] Marita Jokinen,[2] Tuula Jumppanen,[1] Mari Klemm,[2] Juhani Airo,[1] and Annu Suoniemi-Kähärä[2]

[1]Metropolilab Oy, Helsinki, Finland

[2]Thermo Fisher Scientific, Vantaa, Finland

**Keywords**

Discrete Analyzer, Photometric Analyzer, Aquakem

**Goal**

To use an enzymatic method for determination of urea in the water of swimming pools

**Introduction**

Nitrogen-containing impurities such as urea, ammonia, amino-acids, creatinine, and uric acid introduced to swimming pool water by bathers react with free chlorine to form chlorine-containing compounds.[1] It is important to control the level of urea in swimming pool water because urea is a potential source of hazardous ammonia chloramines and a possible nutrient for bacteria and algae, all of which pose a hygienic risk.

In Finland, urea concentration in swimming pools is regulated by Valvira (National Supervisory Authority for Welfare and Health). Based on current guidelines, urea concentration must be less than 0.8 mg/L.

Urea is typically measured by the Koroleff method,[2] which is based on persulphate digestion. Urea can also be measured using an enzymatic method. In the SYKE (Finnish Environment Institute) swimming pool water report,[3] six of the proficiency test participants used the Koroleff method and three laboratories used the enzymatic method. Based on the study, the Koroleff method results were generally lower than results obtained from the enzymatic method. Results of the enzymatic method were closer to

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# Fast, safe, and easy nutrient analysis

## Overview

Determining nutrient levels in drinking water, wastewater, and soil samples is critical for protecting aquatic habitats and maintaining clean and safe drinking water supplies. Utility companies and environmental laboratories must regularly measure elemental phosphorus and nitrogen in sewage water, along with a range of other pollution indicators, to ensure discharge streams are compliant with regulatory standards. Wastewater nutrient analysis can also be used for the assessment of population-level infection, including SARS-CoV-2 surveillance, by providing important biomarker indications for population size.

Traditional wet chemistry techniques, including titrations, flow injection analysis, and other colorimetric techniques, have been used for many years to undertake nutrient analysis of drinking water, wastewater, and soil samples. However, these approaches are slow, labor-intensive and often unreliable, involving hazardous reagents that add substantial costs for waste disposal.

This brochure summarizes how Thermo Scientific discrete analyzers can provide a faster, safer, and more reliable replacement to traditional wet chemistry methods for nutrient analysis.


View the full brochure

# Wastewater surveillance of COVID-19 with Gallery discrete analyzers

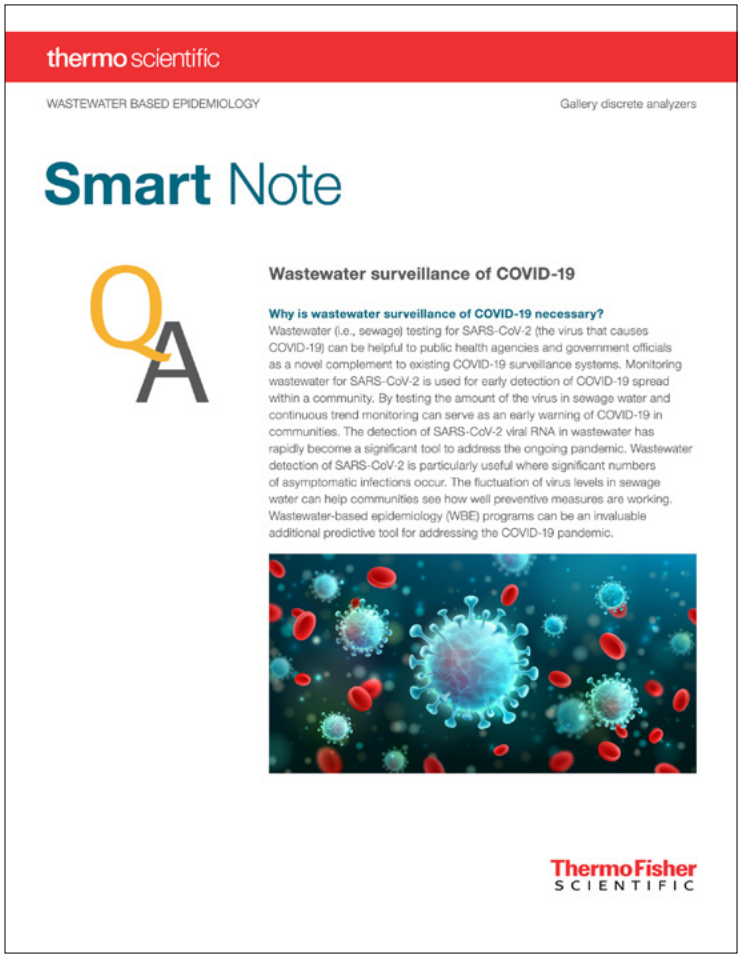
## Overview

The detection of SARS-CoV-2 viral RNA in wastewater has rapidly become a significant tool to address the ongoing pandemic. Wastewater detection of SARS-CoV-2 is particularly useful where significant numbers of asymptomatic infections occur.

Determining the various nutrient parameters such as nitrogen, phosphorus, ammoniacal nitrogen, urea and creatinine, pH, and conductivity for a large number of samples on a daily basis is highly challenging. A discrete analyzer consolidates these parameters and offers a high throughput solution.

In this smart note, learn about strategies to consolidate chemical reference parameters and population biomarker analysis to support the wastewater-based epidemiology.

For more information, watch this interactive webinar with Reg Godwin, from the Environment Agency UK, as he discusses sewage water monitoring by discrete analyzer for population biomarkers and shares their early study results.



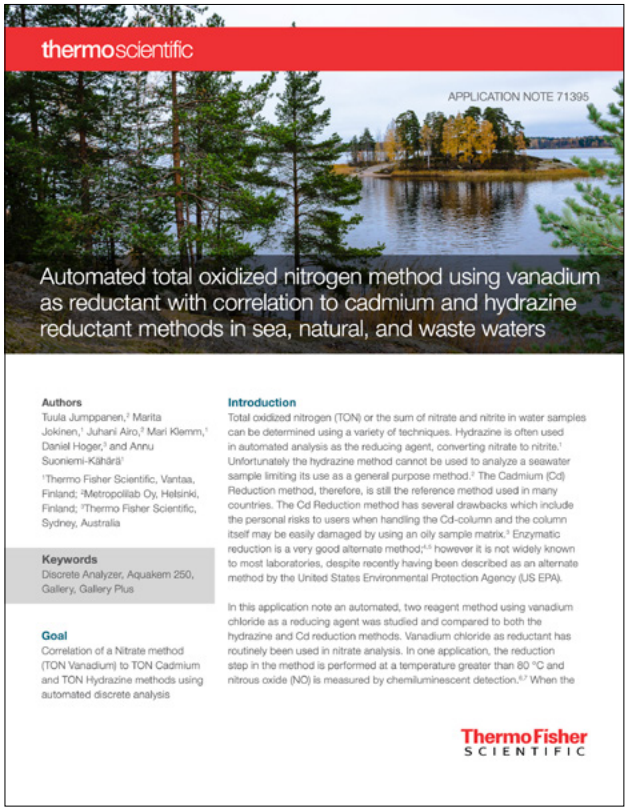

View the full case study

# Automated total oxidized nitrogen method using vanadium as reductant with correlation to cadmium and hydrazine reductant methods in sea, natural, and wastewaters

## Overview

Measurement of total oxidizable nitrogen (TON) is required for accurate determinations of nitrate concentrations in drinking water and wastewater. Traditional TON measurement methods based on cadmium reduction coils have several limitations, such as costly waste disposal and carcinogenic health risks. Thermo Scientific discrete analyzers can be used as a safer alternative for TON measurement, as they support and automate new EPA-approved enzymatic reduction methods.

This application note details the automated TON method using the Gallery discrete analyzer.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APPLICATION NOTE 71395

Automated total oxidized nitrogen method using vanadium as reductant with correlation to cadmium and hydrazine reductant methods in sea, natural, and waste waters

Authors

Tuula Jumppanen,[2] Marita Jokinen,[1] Juhani Airo,[2] Mari Klemm,[1] Daniel Hoger,[3] and Annu Suoniemi-Kähärä[1]

[1]Thermo Fisher Scientific, Vantaa, Finland; [2]Metropolilab Oy, Helsinki, Finland; [3]Thermo Fisher Scientific, Sydney, Australia

Keywords

Discrete Analyzer, Aquakem 250, Gallery, Gallery Plus

Goal

Correlation of a Nitrate method (TON Vanadium) to TON Cadmium and TON Hydrazine methods using automated discrete analysis

Introduction

Total oxidized nitrogen (TON) or the sum of nitrate and nitrite in water samples can be determined using a variety of techniques. Hydrazine is often used in automated analysis as the reducing agent, converting nitrate to nitrite.[1] Unfortunately the hydrazine method cannot be used to analyze a seawater sample limiting its use as a general purpose method.[2] The Cadmium (Cd) Reduction method, therefore, is still the reference method used in many countries. The Cd Reduction method has several drawbacks which include the personal risks to users when handling the Cd-column and the column itself may be easily damaged by using an oily sample matrix.[3] Enzymatic reduction is a very good alternate method;[4,5] however it is not widely known to most laboratories, despite recently having been described as an alternate method by the United States Environmental Protection Agency (US EPA).

In this application note an automated, two reagent method using vanadium chloride as a reducing agent was studied and compared to both the hydrazine and Cd reduction methods. Vanadium chloride as reductant has routinely been used in nitrate analysis. In one application, the reduction step in the method is performed at a temperature greater than 80 °C and nitrous oxide (NO) is measured by chemiluminescent detection.[6,7] When the

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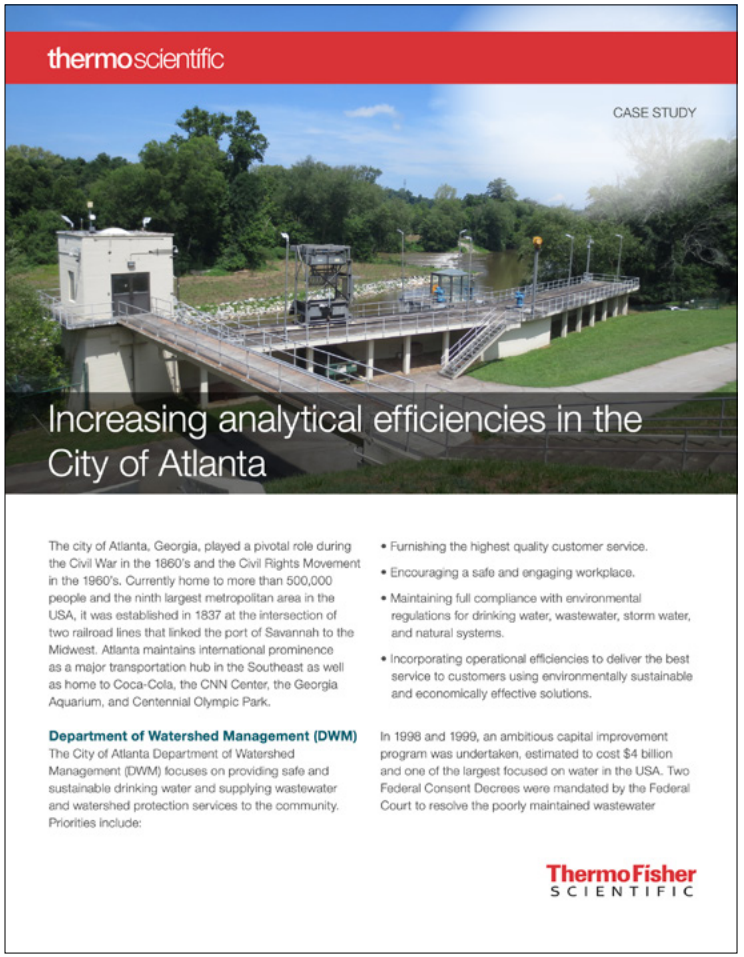
# Increasing analytical efficiencies in the City of Atlanta

**Overview**

The City of Atlanta Department of Watershed Management (DWM) focuses on providing safe and sustainable drinking water and supplying wastewater and watershed protection services to the community. Affectionately dubbed "Gertrude," their Thermo Scientific™ Gallery™ Plus discrete analyzer has an attached electrochemical (ECM) unit that allows them to test pH and conductivity in addition to the desired alkalinity and hardness tests.

"Using the Gallery Plus analyzer freed up a technician. We are actually saving manpower and everyone can go home on time", says Carolyn Duncan, Senior Chemist in the City of Atlanta Watershed Protection Department.

Read more about the department's experience with their discrete analyzer and automated test workflow in this case study.

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# Faster and better analysis of complex samples in a geochemical laboratory

## Overview

Murphy and Son Limited, The Council for Geoscience (CGS), located in Pretoria, South Africa, offers a wide range of geoscientific and analytical services. Previously, the CGS laboratory used a relatively uncomplicated traditional method for determination of the following anions: fluoride (F), chloride (Cl), nitrite ($NO_2$), bromide (Br), nitrate ($NO_3$), phosphate ($PO_4$), and sulphate ($SO_4$). They were particularly interested in examining anion concentrations in water as well as leachable anion concentrations in rock and soil samples.

CGS's investment in the Gallery Plus discrete analyzer enabled them to achieve a huge improvement in anion analysis capability. The lab is now able to examine additional parameters such as nitrate and phosphate at low concentrations, hexavalent chromium (Cr (VI)), ammonia, and cyanide with high throughput testing capacity and minimal maintenance.

Read more about the CGS story and their testing capability improvement for environmental analyses, drinking water quality monitoring, mine water evaluations and geochemical and hydrological mapping in this case study.


View the full case study

# Easy soil testing at a South African fertilizer manufacturer

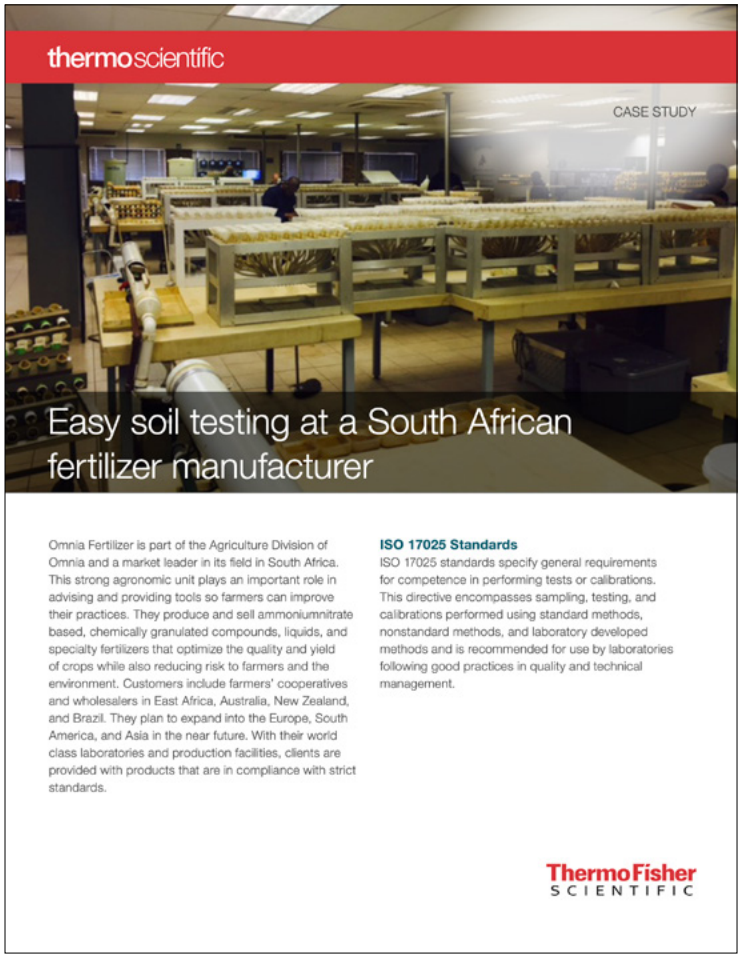
**Overview**

Omnia Fertilizer is part of the Agriculture Division of Omnia and a market leader in its field in South Africa. In the past, the R&D lab used a Segmented Flow Analyzer (SFA) to measure soil samples. With 4,000 samples to test each day during the growing season, operating a SFA was labor intensive, with high maintenance required for troubleshooting and high operation expertise required.

To solve these issues, the managers of the lab purchased a Gallery discrete analyzer. The company discovered it is operator friendly, simple to use, and capable of saving significant amounts of time. The test results were demonstrated with good repeatability and the LIMS interface was an easy integration.

“Maintenance is substantially less than with our older test methods”, says Edna Laubscer, Chemtech Analytical Services Manager

Read more about the fertilizer manufacturer’s experience with discrete analyzers in this case study.

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# Precise analysis for inorganic fertilizers at the Finnish Food Authority

**Overview**

Evira, the Finnish Food Authority located in Helsinki, Finland is charged with providing effective, efficient, consistent, and risk-based control of the entire food chain. The lab at Evira routinely measures potassium (K) and phosphate ($PO_4$) for approximately 1,000 inorganic fertilizer samples per year. In just two hours, they are able to complete all the required analyses using the automated Gallery discrete analyzer. The same analysis used to consume two days with old titration and gravimetric methods.

"This is the best method (with discrete analyzers) for measuring $PO_4$ in inorganic fertilizers. It is much more precise since there is no interference from other analytes", says Aija Pelkonen, Research Chemist at Evira.

Read more about Evira's experience with discrete analyzers for inorganic fertilizer analysis in this case study.


View the full case study

# National Laboratory Service achieves high-throughput biomarker testing for SARS-CoV-2 wastewater surveillance using Gallery Plus discrete analyzers

## Overview

Wastewater testing for SARS-CoV-2 can complement public health agencies' existing COVID-19 surveillance systems with early detection and prediction of COVID-19 spread in a community. The National Laboratory Service (NLS) of Environment Agency UK is one of the laboratories leading the way in the emerging field of wastewater epidemiology.

Determining the chemical reference parameters such as pH, conductivity, and population biomarkers for a large number of samples on a daily basis is extremely challenging, and until now not practical. The automated Gallery discrete analyzer overcomes these challenges. Automated features and parallel determination of multiple analytes from a single sample increase sample throughput and analytical certainty to support public health agencies. In addition, the analyzer's automation features provide true walkaway time for operators to perform other tasks or to monitor multiple systems.

Learn about how NLS consolidates chemical reference parameters and population biomarker analysis to support the wastewater-based epidemiology in this case study.


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CASE STUDY 000263

National Laboratory Service achieves high-throughput biomarker testing for SARS-CoV-2 wastewater surveillance using Gallery Plus discrete analyzers

"If you can warn local or national governments of a COVID outbreak about to occur, that's hugely powerful. Now we can see three to five days ahead if there's going to be a lot of cases presenting at hospitals. Having that early warning via quick, 24-hour turnaround on our biomarker testing, together with the molecular biology results, is something that we're really proud to have implemented. Without the Gallery Plus discrete analyzer, testing wastewater biomarkers at the scale and throughput needed wouldn't be feasible."

—Reg Godwin, Technical Specialist, National Laboratory Service, Environment Agency UK

Several Thermo Scientific™ Gallery™ Plus Discrete Analyzers are in operation providing high-throughput wastewater biomarker analysis at the NLS's Exeter laboratory. Photo courtesy of the NLS.

**Gallery Plus discrete analyzer enables wastewater epidemiology program**

Wastewater testing for SARS-CoV-2 can complement public health agencies' existing COVID-19 surveillance systems with early detection and prediction of COVID-19 spread in a community. Monitoring SARS-CoV-2 in wastewater is particularly useful where significant numbers of asymptomatic infections occur. In addition, the fluctuation of virus levels in sewage water can help agencies determine the effectiveness of preventive measures. The National Laboratory Service (NLS) of Environment Agency UK is one of the laboratories leading the way in the emerging field of wastewater epidemiology.

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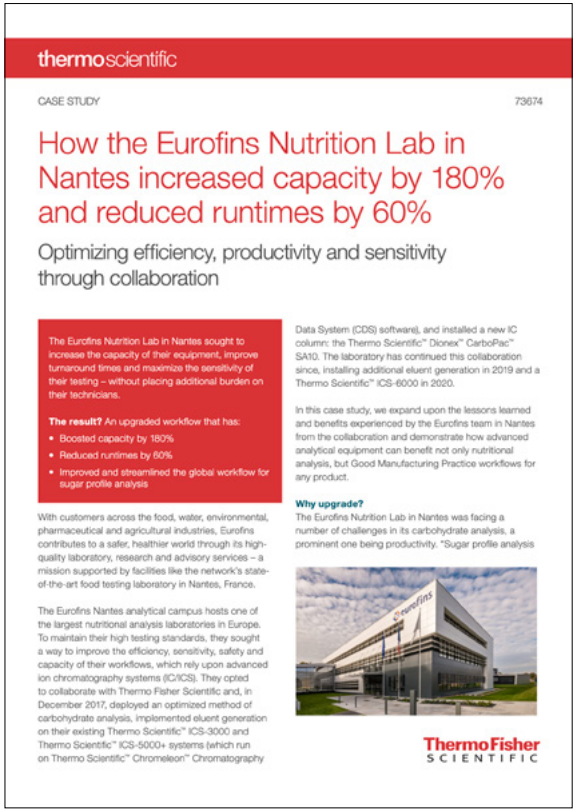
# How the Eurofins Nutrition Lab in Nantes increased capacity by 180% and reduced runtimes by 60%—Optimizing efficiency, productivity, and sensitivity through collaboration

**Overview**

The Eurofins Nutrition Lab in Nantes sought to increase the capacity of their equipment, improve turnaround times, and maximize the sensitivity of their testing—without placing an additional burden on their technicians. The result is the lab has an upgraded workflow that has boosted capacity by 180%, reduced runtimes by 60%, and improved and streamlined the global workflow for sugar profile analysis.

"Thermo Fisher Scientific is already highly recommended as a supplier for equipment for chromatography, inorganic analysis, colorimetric and enzymatic analysis, sample preparation, and more—and we would recommend them to any Eurofins laboratories looking to improve their performance.", says Romain Rivoallan, Production Manager in the Eurofins Nutrition Lab.

In this case study, we expand upon the lessons learned and benefits experienced by the Eurofins team in Nantes from the collaboration and demonstrate how advanced analytical equipment can benefit not only nutritional analysis but Good Manufacturing Practice workflows for any product.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CASE STUDY 73674

How the Eurofins Nutrition Lab in Nantes increased capacity by 180% and reduced runtimes by 60%

Optimizing efficiency, productivity and sensitivity through collaboration

The Eurofins Nutrition Lab in Nantes sought to increase the capacity of their equipment, improve turnaround times and maximize the sensitivity of their testing – without placing additional burden on their technicians.

**The result?** An upgraded workflow that has:

- Boosted capacity by 180%
- Reduced runtimes by 60%
- Improved and streamlined the global workflow for sugar profile analysis

With customers across the food, water, environmental, pharmaceutical and agricultural industries, Eurofins contributes to a safer, healthier world through its high-quality laboratory, research and advisory services – a mission supported by facilities like the network's state-of-the-art food testing laboratory in Nantes, France.

The Eurofins Nantes analytical campus hosts one of the largest nutritional analysis laboratories in Europe. To maintain their high testing standards, they sought a way to improve the efficiency, sensitivity, safety and capacity of their workflows, which rely upon advanced ion chromatography systems (IC/ICS). They opted to collaborate with Thermo Fisher Scientific and, in December 2017, deployed an optimized method of carbohydrate analysis, implemented eluent generation on their existing Thermo Scientific™ ICS-3000 and Thermo Scientific™ ICS-5000+ systems (which run on Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS) software), and installed a new IC column: the Thermo Scientific™ Dionex™ CarboPac™ SA10. The laboratory has continued this collaboration since, installing additional eluent generation in 2019 and a Thermo Scientific™ ICS-6000 in 2020.

In this case study, we expand upon the lessons learned and benefits experienced by the Eurofins team in Nantes from the collaboration and demonstrate how advanced analytical equipment can benefit not only nutritional analysis, but Good Manufacturing Practice workflows for any product.

**Why upgrade?**

The Eurofins Nutrition Lab in Nantes was facing a number of challenges in its carbohydrate analysis, a prominent one being productivity. "Sugar profile analysis

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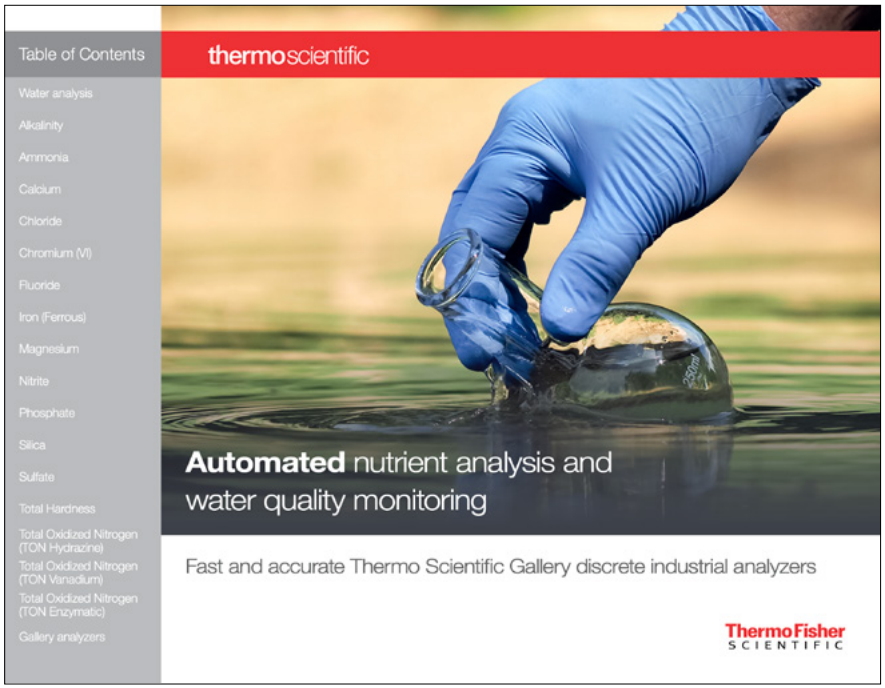
View the full case study

# Automated nutrient analysis and water quality monitoring

## Overview

This analytical guide summarizes the use of Gallery discrete analyzers to detect the various nutrient and water analytes of interest, their respective testing chemistries, applicable regulatory method references, reagents required, sample matrixes, calibration curves, method detection limits, precision summaries, and method performance linearities.

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**Discrete analyzer products**

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