

BEVERAGE INDUSTRY

Water Analysis Tools for Lab and Process



Your Partner for Water Analysis in the Beverage Industry

At Hach, we understand your water needs when it comes to ensuring the highest levels of product quality, consistency and safety. Since 1947, Hach Company has designed, manufactured, and distributed world-class instrumentation, test kits, and reagents for testing water quality in a variety of beverage industry applications, including influent, Clean-In-Place (CIP), and effluent water treatment.

We invite you to take a look at our comprehensive line of product solutions and services. They're the most accurate and dependable products you can buy.

Hach offers:

- *On-line process instrumentation and reagents*
- *Laboratory equipment, reagents, and supplies*
- *More EPA-approved methods than any other company*
- *Portable test kits and field instruments*
- *Automatic samplers and flow meters*
- *Local sales and service teams*
- *Service partnership programs and customized training*

INFLUENT WATER TREATMENT / CIP

Chlorine

Excessive chlorine harms membrane-based filtration systems and alters water's taste. Too little chlorine creates an opportunity for microbiological growth. Close monitoring of chlorine levels preserves filtration membranes and prevents the formation of harmful bacteria. Many disinfection programs employ a chlorine, chlorine dioxide or ozone strategy to prevent microbiological growth. Whether raw water, process water, rinse water, or effluent water, constant monitoring of disinfection parameters helps ensure that processes meet product safety, consistency and environmental regulations.

Conductivity/Total Dissolved Solids (TDS)

Conductivity or TDS, the most widely used control parameter for CIP applications, measures caustic or acidic solution strength. Conductivity also monitors process completion to identify product variation and control chemical additives. Inductive conductivity, sometimes referred to as electrodeless or toroidal, remains the industry's primary choice due to sanitary 3A design standards. Conductivity also determines filtration media efficiency by gauging the dissolved, ionic constituents before and after the filtration process.

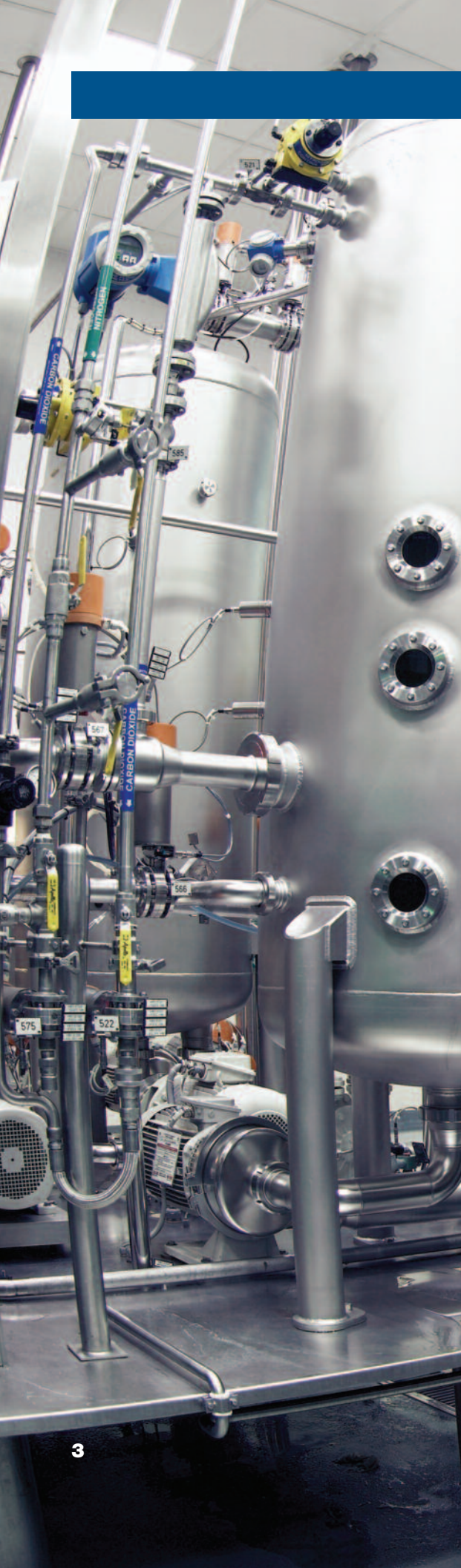
pH / ORP

pH and ORP commonly measure control processes throughout a facility. pH adjustment prior to filtration prevents precipitation of dissolved materials such as silica and calcium carbonate that clog filters. Maintaining proper pH also ensures maximum effectiveness and minimizes the costs of chemical additives, such as disinfectants. ORP monitors the effectiveness of chlorine removal (activated carbon filtration) and controls de-chlorination chemical addition, protecting upstream RO units and reducing chemical costs.

Turbidity

Depending on the water source, turbidity varies dramatically. Often, filtration systems remove excess turbidity and other minerals. While conductivity also monitors dissolved solids, on-line turbidity measurement is the preferred method to monitor filtration efficiency and control backwashing cycle frequency.





pH

Among the most commonly reported parameters in discharge allowances, continuous pH monitoring alerts a facility to make process adjustments well in advance of a violation. In addition, pH monitoring in multiple stages of the wastewater treatment process optimizes chemical usage and biological activity to control costs.

Dissolved Oxygen (DO)

The aeration and activated sludge processes require a steady supply of oxygen to function effectively. Insufficient oxygen results in process inefficiency, producing foul-smelling intermediate products and incomplete reactions. Too much oxygen results in excessive energy loss. Since aeration and activated sludge processes constitute up to 70% of a wastewater plant's energy costs, precise monitoring and control of oxygen allows effective and efficient functionality.

Turbidity and Total Suspended Solids (TSS)

Turbidity and TSS measurements are commonly used for wastewater discharge reporting. They also control dissolved air flotation systems, dewatering equipment, and clarifier influent. When applied to polymer feed systems, the additional control often results in significant polymer savings. On-line monitoring and regular sampling protocols reduce the potential of putting excessive solids into the wastewater stream and help prevent permit violations and associated fines.

Organics

In wastewater with high organic loads, a facility uses chemical treatment and physical processing to reduce load levels to those acceptable for either re-use or discharge into the environment. Efficient management of organics typically involves Biological Oxygen Demand (BOD) for reporting purposes. However, since the test takes 5 days, surrogates such as Chemical Oxygen Demand (COD), Total Organic Carbons (TOC), and Spectral Absorption Coefficient (SAC) may be used. These offer quicker test results and early detection of upsets or spills for reduced operational and maintenance costs. COD, a relatively simple lab procedure, reduces testing time to 2 hours. On-line TOC monitoring provides results every 15 minutes and on-line UV254 (SAC) monitors continuously for real-time control.

Comparison of Methods for Measuring Organics

Parameter	Measured Variable	Method	Substance Groups Measured
Biochemical Oxygen Demand (BOD)	Oxygen Consumption	Microbial Oxidation	<p>A Venn diagram illustrating the relationship between four organic measurement parameters: SAC (Spectral Absorption Coefficient), COD (Chemical Oxygen Demand), BOD (Biochemical Oxygen Demand), and TOC (Total Organic Carbon). SAC is represented by a blue circle, COD by a pink circle, BOD by a purple circle, and TOC by a green circle. SAC is contained within COD. BOD is contained within COD. TOC contains both COD and BOD.</p>
Chemical Oxygen Demand (COD)	Oxygen Consumption	Wet Chemical Oxidation	
Total Organic Carbon (TOC)	Carbon Concentration	Thermal, Wet Chemical Oxidation	
Spectral Absorption Coefficient (SAC)	UV Absorption at $\lambda = 254$ nm	UV Absorption Measurement	

Hach lab instruments are designed to help you confidently meet compliance objectives in influent, CIP, and wastewater treatment, as well as in your quality control lab.

Laboratory & Field Analysis

PHOTOMETRIC AND COLORIMETRIC



DR Spectrophotometers

Accurate, versatile and easy to use. Perform analyses of vital industrial parameters including chlorine, COD, hardness, iron, nitrogen, ozone, phosphorous, silica and many more!

Fully integrated instrument/reagent systems:

DR Series Spectrophotometers combined with TNTplus™ reagents for an integrated analytical solution.

DR 5000™ UV-vis Scanning Spectrophotometer (190 to 1100nm; + 1 nm accuracy; 2 nm bandwidth)

Superior analysis with UV-vis scanning, over 270 pre-programmed water analysis methods and 2000 data logging points. Optional Sipper Sampling Module and Pour Thru Cell Kit for improved measurement accuracy. Transfer data easily with USB capability.

DR 3900™ Portable Spectrophotometer (320 to 1100nm; + 1.5 nm accuracy; 5 nm bandwidth)

Prevent measurement errors...simply. The DR 3900 guides you step-by-step through the testing procedure like a GPS, so you can get the accurate results you need every time.

DR 2800™ Portable Spectrophotometer (340 to 900nm; + 1.5 nm accuracy; 5 nm bandwidth)

Hach's premium portable spec (optional battery) with over 270 pre-programmed methods and 50 user entered calibrations.

TNTplus® Bar-Coded Chemistries

Developed for use with the DR 5000, DR 3900 and DR 2800 Spectrophotometers only.

- Error free and fast—instrument automatically detects and runs the correct method
- Easy, accurate recognition—color-coded parameters and ranges
- Best results—10 measurements in one rotation, eliminating outliers; optically superior glassware



Brewery Methods

The Brewery Analysis Package software upgrade contains 12 specific brewery assays that conveniently upload via USB to a DR 5000. Includes procedures for: Anthocyanogens, Iron, Steam volatile phenols, Beer color, Iso-alpha-acids, Total polyphenols, Bitterness units, Photometric iodine, Thiobarbituric acid number (TAN), Free amino nitrogen, Reductones, and Vicinal diketones.

DR/800 Series Colorimeter

Rugged, waterproof hand-held instruments for inexpensive multi-parameter testing. Available in models DR/820, DR/850 or DR/890 preprogrammed to test for at least 20, 50 or 90 parameters, respectively.



ez COD® Recycling for Hach COD Vials

Reduce COD reagent recycling costs and simplify the task of recycling.

- One low price—includes container, pickup, and recycling fees
- Hassle free—place entire vial into receptacle
- Right sized—pick from three programs based on your annual COD waste output (5, 20, and 55 gallons)



2100Q Portable Turbidimeter

The 2100Q Portable Turbidimeter offers a unique combination of advanced features, such as easy calibration and simplified data transfer, and measurement innovation for rapidly settling samples, giving you confidence you're getting accurate results every time.

- Easy on-screen assisted calibration and verification
- Simple data transfer
- Accuracy for rapidly settling samples
- Convenient data logging



Hach Test Kits

From beakers to colorimeters, everything you need is supplied in Hach Single- and Multi-parameter Test Kits.



Hach Test Strips

Easy to use for fast and reliable water quality screening.



HQd™ Meters and IntelliCAL™ Probes

Now offering a complete water analysis portfolio of testing parameters with standard, rugged, and ultra options. Hach's HQd system gives maximum measurement flexibility and ease of operation with interchangeable probes and automatic parameter recognition.

HQd Benchtop Meters offer all the benefits of the digital HQd system, with simplified data transfer and easy-to-read results on a large, backlit screen.

- 500-result datalog stores measurements, calibrations, check standards, user ID, sample ID, and time and date stamp
- Plug-and-play IntelliCAL probes in standard and rugged versions for lab and field applications
- Wide variety of cable lengths

ELECTROCHEMICAL

sensION®+ Meters and Probes

Hach sensION+, an all-in-one system with guided menu navigation makes general testing fast and simple. Each system is designed to be used in a wide variety of applications and comes complete with everything you need to start testing.



TITRAMETRIC

Radiometer Analytical TitraLab® 860/870 Workstation and TitraLab® 55 Volumetric Karl Fischer Workstation

Ideal for acidity, chloride, formol index, pH/mV, and sulfate measurement. Use the TitraLab 55 Volumetric Karl Fischer Workstation when moisture content is a critical factor.

- Peroxide number: edible fats and oils
- Chloride: milk, butter, other dairy products
- Ascorbic acid: fruit juice and food



AutoCAT™ 9000 Automatic Chlorine Amperometric Titrator

Monitor and protect RO membranes and ion exchange resins, optimize dechlorination processes, and calibrate process instruments. Measures free and total chlorine, chlorine dioxide, and sulfite.



Hach Digital Titrator

Get accurate ($\pm 1\%$), convenient titrations without the bulk, fragility, or waste of a conventional burette. Test for eighteen parameters including chlorine, hardness, and iron. Uses interchangeable titrant cartridges.



FLOW & SAMPLING

Hach Sigma SD900 Automatic Sampler

Delivers reliable results, easy operation and annual maintenance savings. Deploy the controller in various environments with a portable, indoor refrigerated or all-weather base.



- Easy to read display even in bright and dimly lit environments
- Simple programming and set up (less than 2 minutes for sampler routine) for fewer programming errors
- Extended pump tubing life (20,000 cycles) reduces annual maintenance costs and pump down time
- See-through pump cover allows quick and convenient visual inspection and troubleshooting
- Desiccant tube changes as easily as a standard light bulb

Hach Sigma Open Channel Flow Meters

Advanced ultrasonic sensors provide level measurement over flumes and weirs. All meters contain built in tables to calculate flow.

The Sigma 980, a permanent flow and water quality meter, combines flow measurement with rainfall, pH, temperature, and ORP. Contact your Hach representative for other flow measurement technologies, including advanced radar or ultrasonic Doppler, to measure flow when flumes or weirs are impractical.



MICROBIOLOGY

Microbiology Media

Hach's ready-to-use Microbiology Media eliminates measuring, mixing, and autoclaving necessary to prepare media. Glass and plastic ampules, bottled media, agar plates, powder pillows, and containers afford maximum shelf life and ease of use. Available for testing/measuring total coliforms, *E. coli*, yeast and mold, Heterotrophic bacteria, PRY, and more.



MEL/850 Portable Lab

Provides comprehensive bacterial testing wherever and whenever ammonia, chlorine, total coliforms, *E. coli*, nitrate, nitrite, pH, reactive phosphorus, sulfide, TDS/conductivity, temperature, and turbidity monitoring is needed.

BART™: Easy Bacterial Detection

A simple and effective way to detect specific bacterial groups and algae in water. The Biological Activity Reaction Test (BART*) provides an excellent method for determining which specific type of bacteria is the source of an existing problem.



**BART is a trademark and patented product of Droycon Bioconcepts, Inc., U.S. Patent 4,906,566*

HACH CHEMISTRIES/ STANDARDS

Hach Chemical Reagents

Hach's water analysis reagents are more than chemicals—they are a complete system that provides confidence in your test results. No one matches Hach's 60 years of experience providing accurate, practical, and easy-to-use analytical products. Chemical reagents include DO, hardness, nitrogen, ozone, phosphate, sulfate and many more.

- Formulated to minimize interferences, test complexity and analysis time
- Performance tested by chemists
- Designed for maximum stability and consistency
- Certified by rigorous ISO process procedures

AccuVac® Ampules

Easy-to-use AccuVac reagents are ideally suited for analysis of many parameters, including ozone. The ampules contain the precise amount of reagent needed for a single test. Simply snap the tip and the ampule draws in the correct amount of sample. Multiple ranges available.



OTHER TOOLS

BODTrak™ Apparatus

Simplifies BOD testing—Just add a measured sample and one BOD Nutrient Buffer Pillow to each of six BOD bottles and connect them to the pressure sensors on the apparatus. It then does the rest.

Digesdahl® Apparatus (Patented)

Quickly digests a variety of organic and mineral samples without metal catalysts in as little as 10 minutes. Use to determine Kjeldahl nitrogen (crude protein), phosphorus, calcium, copper, iron, lead, and manganese.

Lachat Instruments IL500-series TOC/TN Analyzers

For reliable and robust laboratory determination of TOC, use an IL500-series TOC/TN Analyzer. An optional solids analysis module is available for catalyst-free analysis of solids.

LABORATORY SUPPLY

Hach offers a wide selection of labware to meet your analytical needs. Balances, bottles, glassware, hot plates, microscopes, pipets, pumps, samplers, and other apparatus are standard stock items. From Acidity to Zinc, Hach offers the labware for your test parameter.



Hach process instruments help you save money by controlling energy and chemical costs and optimizing staff efficiencies throughout the beverage facility.

On-Line Sensors & Analyzers

ALKALINITY

APA 6000™ Alkalinity Analyzer

Completely automated operation: self-cleaning, self-calibrating, and self-priming for low maintenance.

- Accurate alkalinity determinations to 1000 mg/L as CaCO₃
- Optional sample sequencing kit for using a single analyzer to monitor two separate sample flows



CHLORINE/CHLORINE DIOXIDE

CL17 Chlorine Analyzer

Reliable, economic on-line chlorine analysis. Samples are analyzed every 2.5 minutes using a minimum of indicator and buffer solutions.

- Colorimetric DPD chemistry
- Automatic color/turbidity compensation
- Free or residual chlorine (0-5 mg/L)



AMMONIA

AMTAX™ sc Ammonia Analyzer

Measures NH₄-N concentrations as low as 0.05 mg/L and as high as 1000 mg/L.

APA 6000™ Low Range Ammonia and Monochloramine Analyzer

Requires only five minutes per sample stream for complete analysis of free ammonia, total ammonia, and monochloramine.



9184 sc Free Chlorine Sensor or 9187 sc Chlorine Dioxide Sensor

These on-line, single-channel industrial sensors measure free chlorine and chlorine dioxide at the ppb and ppm levels.

- Low minimum detection limit
- Wide continuous measurement range 0-20 mg/L for chlorine; 0-2 mg/L for ClO₂
- Available models to measure hypochlorous chlorine (HOCl) only or total free chlorine (TFC)



CONDUCTIVITY

Inductive (Electrodeless) Sensors

Monitor CIP and “push water” control with any of Hach’s Inductive Conductivity Sensors. With no direct contact between the measuring element and the sample, they are contamination and corrosion resistant.

- Rugged, non-fouling design
- Wide measurement range
- Teflon® coating available for harsh applications



Contacting Conductivity/Resistivity Sensors

Monitor membrane health and demineralizer beds with any of Hach's Contacting Conductivity/Resistivity Sensors. They're offered in a variety of materials and mounting styles to exacting tolerances to accommodate most configurations.

- High accuracy using Hach's DRY-CAL™ method
- Accurate temperature compensation

si792(x) 2-Wire Transmitter



A full-featured, intuitive 24 Vdc loop-powered electrochemistry transmitter for monitoring pH, ORP, and conductivity. Rugged construction is designed for Class I, Division 2 (C1D2) or Intrinsically Safe (IS) applications. Standard digital communication capabilities include HART®, PROFIBUS PA, or Foundation FIELDBUS.

CONTROLLERS

Hach Digital Controllers

Use any of the digital family sensors with the **sc200™**

Digital Controller

that accepts up to two sensors or the **sc1000™**

Universal Controller

that accepts up to eight sensors in any combination.

- Plug-and-play operation without special ordering or software configuration
- Many communication options including MODBUS® and wireless modes



Hach's Digital Sensor family includes ammonia, chlorine, chlorine dioxide, conductivity, DO, nitrate, ORP, ozone, pH, phosphate, sludge blanket level, suspended solids, turbidity, and UV absorption.



DISSOLVED OXYGEN

Hach LDO[®] Dissolved Oxygen Sensor

This revolutionary process sensor applies luminescent technology to continuously monitor dissolved oxygen. The instrument controller informs staff immediately of DO changes and can be integrated with a variable frequency drive or PLC control system to control the amount of oxygen being injected into the system.



- Maintains accuracy with as little as one calibration per year
- Reduced cleaning frequency and simple maintenance
- No electrolyte solutions to poison or replenish
- No membranes

Hach Orbisphere 6110 Total Package Analyzer

Easily and automatically provides oxygen and carbon dioxide concentrations for both the headspace and liquid in bottles or cans.

- Gas-phase analysis with minimal maintenance
- Accurate TPO & CO₂ analysis
- Ergonomic operation



FLUORIDE

CA610[™] Fluoride Analyzer

The proven ion-selective electrode technology of this analyzer provides continuous, reliable monitoring.



HARDNESS

SP 510[™] Hardness Analyzer

Samples water every two minutes and operates automatically for up to 60 days making it the ultimate in trouble-free, hands-off operation. Rugged, lightweight, and self-contained, the SP 510 provides reliable, real-time monitoring that significantly reduces process expenses.



- Low maintenance design allows continuous unattended use for two months
- Linear peristaltic pump, seal free solid state mixer, and compact colorimeter combine for reliable, maintenance-free readings
- Easy-to-read LED indicator reports water condition instantly to activate regeneration with built-in failsafe to prevent false alarms

APA 6000[™] Hardness Analyzer

For advanced analysis, the APA 6000[™] Hardness Analyzer uses EPA-approved calmagite chemistry for low-range hardness (0.05 to 10.0 mg/L soluble hardness, calcium and magnesium, as CaCO₃).



ORGANICS

UVAS sc Sensor, 1 mm, 2 mm or 5 mm, with sc200 Controller

Continuous UV 254 Absorbance/Transmittance measurements with the UVAS sc Sensor protects plant treatment processes from high organic loads with repeatable, accurate measurement.



- On-line analysis allows treatment plants to operate more efficiently
- Flow through design with no sample chamber and self-cleaning wipers to reduce maintenance
- Stable factory calibration saves time and reduces maintenance costs

pH / ORP

LCP Analog and pHD™ Digital pH/ORP Sensors

Unsurpassed accuracy and greater reliability for less downtime and maintenance. Provides an exceptional warranty—1 year and 30 month pro-rated replacement.



- Eliminates measurement error due to streaming currents, drastically reducing drift
- Replaceable salt-bridge/protector simplifies maintenance and extends sensor life
- Various materials and mounting styles available for any application

8362 sc High Purity Water pH or ORP Probe Systems

Air-tight system avoids pH shifts due to CO₂ dissolution. Electrode housing designed to prevent internal and external streaming current interference to minimize measurement drift.



OZONE

9185 sc Amperometric Ozone Analyzer

Operates with little interference from oxidants such as chlorine, chlorine dioxide, and pH. Comes complete with a 2-year supply of pre-mounted ozone selective membranes.



PHOSPHATE

Series 5000 Phosphate Analyzer



Uses colorimetric phosphate analysis with a patented pressurized reagent delivery system for continuous, low-maintenance operation.

SILICA

Series 5000 Silica Analyzer

Continuous wet analysis of silica provides better results than conductivity measurement due to silica's poor ionization. The Hach Series 5000 Silica Analyzer leads the industry in convenient, accurate silica analysis.

- *Colorimetric silica analysis*
- *Patented, pressurized reagent delivery system*
- *Grab samples without interrupting sample flow*



SLUDGE LEVEL

SONATAX sc Sludge Blanket Level Probe

Ideal tool to optimize sludge extraction, manage recirculation, and warn of potential solid wash outs or process upsets by continuously measuring the depth from the surface or height from the tank floor. Maintenance is reduced with the probe's innovative wiper design. Automatic frequency adjustment provides superior accuracy.



TOTAL ORGANIC CARBON

BioTector TOC Analyzer

Designed to provide low maintenance, online TOC monitoring even in the most difficult sample applications.

- *Self-cleaning technology—prevents clogging and sample contamination and ensures measurement accuracy*



FilterTrak 660™ sc Laser Nephelometer

The laser turbidity method used in the FilterTrak 660™ sc Laser Nephelometer makes ultra-low measurement of turbidity possible to optimize RO filtration systems.

- *0.0 to 5.0 NTU range*
- *Detects submicron-size particles, a precursor to larger particles*



TURBIDITY AND SUSPENDED SOLIDS

SOLITAX™ sc Turbidity and Suspended Solids Analyzer

When suspended solids measurements are needed in addition to turbidity, use Hach's SOLITAX sc Turbidity combined with Suspended Solids Sensors.

- *Ratio technology provides accurate measurements without color interference*
- *Self-cleaning device*



“Hach has been a good partner for us for many years now. Their instruments have proven very reliable, and we've had Hach products in place here for 15 to 20 years, in some cases, to help us in our quality assurance efforts. That reliability is why we keep going back to Hach.”

*Barrie Nolte, Quality Scientist
Ocean Spray Cranberries*

1720E Low Range Turbidimeter

Provides the sensitivity and stability required to continuously monitor turbidity at very low levels (0 to 100 NTU).

- *Bubble removal system eliminates the most significant interference in low level turbidity measurement*
- *Simple plug-and-play connections*
- *Two year warranty*



The right products to optimize your influent, CIP, disinfection, and wastewater applications.



We offer a comprehensive selection of process instruments and laboratory equipment to monitor water quality in a variety of applications. Our products are the most accurate and dependable available—improving production efficiency, maximizing up time and reducing your cost of ownership. Our broad range of products includes:

- *On-line process instrumentation*
- *Laboratory equipment and supplies*
- *Field testing instruments*
- *Portable test kits*
- *Reagents*
- *Automatic samplers*
- *Flow meters*

The right people with the experience and expertise you need.



Chad Nelson
Industrial
Support
Specialist

Service

With over 60 years in the water analysis industry, our development and support teams understand the unique needs of influent, CIP, and effluent water treatment applications. Our technical consultants' commitment to quality service ensures that you receive the highest quality support; a commitment that doesn't end with the sale.

- *Knowledgeable and responsive technical support teams.*
- *Service partnership programs: Our all-inclusive agreements for service and support provide confidence and security for your operations.*
- *In-factory services: Including warranty and repair services, check-up and calibration, and service loaners.*
- *On-site services: Includes warranty and field repair work, start-up and installation services, training and preventive maintenance plans.*
- *Custom service programs: For your unique requirements.*
- *Rental and lease programs.*

Training

As a vital part of the success of analysis, we provide hands-on water analysis training workshops across the country, as well as web seminars. Plus, custom training classes are available at our facilities in Loveland, Colorado or at your facility by special arrangement.

For more information, or to contact your local sales representative, call 1-866-450-4248 or go to www.hach.com

Outside the United States, call 970-669-3050.

