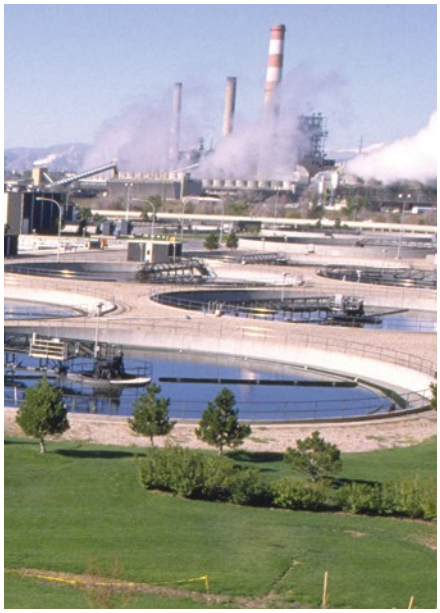
Complete Water Analysis for

CHEMICAL AND REFINING INDUSTRY

HACH®

Be Right™



YOUR PARTNER FOR WATER ANALYSIS IN THE CHEMICAL AND REFINING INDUSTRY

At Hach®, we understand your needs when it comes to maximising the efficiency and effectiveness of your boiler/cooling and waste-water processes.

Hach has designed, manufactured, and distributed world-class instrumentation, test kits, and reagents for testing water quality in the chemical and refining industry. We invite you to take a look at our comprehensive line of product solutions and services. They are the most accurate and dependable products you can buy.

Hach offers:

- On-line process instrumentation and reagents
- Laboratory equipment, reagents, and supplies
- The most approved water analyses to meet environmental regulations
- Portable test kits and field instruments
- Automatic samplers and flow meters
- Prepared media for microbiological testing
- Local sales and service teams
- Service partnership programs and customised training
- Prognosys, cutting edge predictive diagnosis systems

The following water quality parameters are a sample of those most critical to maintaining your boiler/cooling and wastewater processes efficiently and effectively. The remainder of this guide provides detailed information on the specific solutions Hach offers.

Key Parameters for Boiler/Cooling Processes

pH

The pH of cooling and steam processes should be tightly monitored and controlled to optimise the use of critical inputs like chemical addition for corrosion and scale protection, as well as microbial protection in cooling towers. The pH of pre-treatment water should also be monitored and controlled to prevent corrosion of feedwater piping and optimise efficiency of pre-treatment equipment.

Dissolved Oxygen

At the elevated temperatures of the steam cycle, minute quantities (ppb) of oxygen can cause severe corrosion problems in boiler and feedwater piping. Monitoring at the ppb level is critical to maintaining the equipment since several variables can cause changes in DO. These include fluctuations in condensate return; fluctuating steam pressures; plugged, broken or missing nozzles or trays; varying feedwater flows; and air in-leakage from process.

Organics

Measurement of Total Organic Carbon (TOC), Total Inorganic Carbon (TIC), Total Carbon (TC) and Volatile Organic Carbon (VOC) is important for boiler/cooling water and return condensate. Process break-through could lead to severe costs and implications like damage to expensive capital equipment and unplanned process downtime. A multi-parameter TOC analyser is crucial to ensure safeguarding of sensitive processes in clean water applications.

Silica

Controlling volatile silica contaminants is critical to avoid fouling and other adverse effects in superheaters, turbines, heat exchangers, condensers and dryers, where heat transfer efficiency could ultimately impair production efficiency. Plus, monitoring silica detects demin breakthrough faster than resistivity, resulting in improved make-up water quality control.

Sodium

Sodium levels are an important index of water quality throughout the steam cycle. Monitoring sodium concentration is necessary for applications involving on-site power generation and/or high concentrations of caustic soda and other corrosive chemicals. Changes in sodium levels indicate leaks in heat exchangers and carry-over of sodium phosphate-based chemistries, both of which can have catastrophic effects on turbine blades or on the boiler's heat exchange surfaces.

Key Parameters for Wastewater

pH

The continuous monitoring of pH plays an important role in alerting a facility of necessary process adjustments well in advance of a violation. Additionally, pH monitoring at various stages within the wastewater treatment process is critical for maintaining bugs' health, optimising chemical usage, and preventing corrosion to control costs.

Dissolved Oxygen

The activated sludge process for wastewater treatment requires a steady supply of oxygen to function effectively. Insufficient oxygen slows down organisms, makes facultative organisms less efficient, and favors production of foul-smelling intermediate products. Since this process constitutes roughly 70 % of the wastewater plant's energy costs, precise monitoring and control of oxygen enables effective and efficient processes.

Turbidity/Total Suspended Solids

Total Suspended Solids measurements are commonly used for monitoring and controlling dissolved air flotation systems, dewatering equipment, clarifier influent, effluent, Return Activated Sludge (RAS) and Waste Activated Sludge (WAS). When applied to polymer feed systems, the resulting additional control often results in significant polymer savings.

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) or Total Organic Carbon (TOC) may be used as reliable and faster substitutes. Spectral Absorptions Coefficient (SAC) or Oil in Water (OiW) probes may be used for trend measurement. A quick COD test kit is a simple procedure, reducing testing times to about 20 minutes, while on-line TOC monitoring offers real time control. A TOC analyser is cost-effective and capable of process control responding to all types of organics (dissolved and suspended).

Hach Water Analysis Tools for the Chemical and Refining Industry

ANALYSIS PARAMETER	PROCESS INSTRUMENTS AND ANALYSERS	LAB AND FIELD ANALYSIS														
		Photometric and Colorimetric							Electro chemi-cal	Titra-metric		Micro-biology		Other Tools		
		UV/VIS Spectrophotometer	SL1000 PPA	Portable Labs	Turbidimeters	Colour Meters	Prepared Reagents	Test Kits and Test Strips	HQd and sensION+ Probes and Standards	AT1000 Automatic Titrators	Digital Titrator	Microbiology Media	MEL Portable Labs	HSA-1000 Analyser	Sigma / Bühler Samplers	Laboratory Supplies
Alkalinity	• APA 6000 Analyser	■	■	■			■	■	■	■	■					■
Ammonia	• AMTAX sc Analyser	■	■	■			■	■	■			■	■			
ATP							■									■
Biochemical Oxygen Demand (BOD)	• UVAS sc Sensor* • BioTector TOC Analyser*						■		■							■
Chlorine	• CL17 Analyser • CLF10 sc Analyser • 9184 sc Analyser	■	■	■			■	■			■		■			
Chemical Oxygen Demand (COD)	• UVAS sc Sensor* • BioTector TOC Analyser*	■					■									■
Chlorine Dioxide	• 9187 sc Analyser	■		■			■									■
Conductivity	• Hach Contacting Conductivity Sensors • Hach Inductive (Electrodeless) Conductivity Sensors		■	■			■		■					■		
Copper		■	■	■			■	■								■
Colour (APHA/Gardner)		■				■										
Dissolved Oxygen	• LDO Model 2 Probe (ppm) • K1100 LDO Analyser (ppb) • 3100 Portable	■		■					■	■	■		■	■		■
Flow	• Sigma Open Channel Flow Meters • Hach U53 Open Channel Analyser • Hach Flow Monitors / Totalisers and Sensors													■		
Hardness	• APA 6000 Analyser • SP510 Analyser	■	■	■			■	■		■						■
Hydrazine, Oxygen Scavengers, Reducing Agents	• 9186 Oxygen Scavenger / Hydrazine Analyser	■		■			■									
Iron		■	■	■			■	■				■	■			■
Lead		■		■			■									■
Microbiology												■	■			■

*By correlation.

From Alkalinity to Zinc, Hach offers portable, laboratory and process instruments, and reagents for more than 100 test parameters—the broadest range for water analysis in the chemical & refining industry.

		LAB AND FIELD ANALYSIS														
		Photometric and Colorimetric							Electro chemi-cal	Titra-metric		Micro-biology		Other Tools		
ANALYSIS PARAMETER	PROCESS INSTRUMENTS AND ANALYSERS	UV/VIS Spectrophotometer	SL1000 PPA	Portable Labs	Turbidimeters	Colour Meters	Prepared Reagents	Test Kits and Test Strips	HQd and sensION+ Probes and Standards	AT1000 Automatic Titrators	Digital Titrator	Microbiology Media	MEL Portable Labs	HSA-1000 Analyser	Sigma / Bühler Samplers	Laboratory Supplies
Moisture, KF										■						
Molybdate		■		■			■	■								■
Monochloramine			■	■				■								
Nitrate	• Nitratax plus sc Sensor			■			■	■	■				■			■
Oil and Grease	• FP360 sc Oil-in-Water Sensor	■					■									■
Organics	• BioTector TOC Analyser • UVAS sc Sensor	■														
Ozone	• Orbisphere C1100 Ozone Sensor	■		■			■	■								■
pH/ORP	• Hach Differential pH Sensors • pHD Differential Sensors • 8362 sc High Purity pH or ORP Panel		■	■			■	■	■						■	■
Phosphate	• Phosphax sc Analyser • 5500 sc Silica Analyser	■		■			■	■					■			
Sample Conditioning	• Filtrax Sample Filtration Conditioning System	■														
Silica	• 5500 sc Silica Analyser	■		■			■	■								■
Sludge	• Sonatax sc Sludge Blanket Level Probe															
Sodium	• 9245 Sodium Analyser	■							■							
Sulfate		■		■			■	■								■
Sulfite		■		■			■	■			■					
Total Organic Carbon (TOC)	• BioTector TOC Analyser	■					■									■
Total Suspended Solids	• TSS sc															
Turbidity	• FilterTrak 660 Nephelometer • 1720E Turbidimeter • TSS sc • Surface Scatter 7	■			■		■						■			
Zinc				■			■	■								■

Hach Process Instruments and Analysers

BioTector B3500 Analyser

1720E Low Range Turbidimeter

CL17 Chlorine Analyser

UVAS sc Organics Sensor

K1100 Dissolved Oxygen Sensor

5500 sc Silica Analyser

Hach Lab and Field Analysis

DR6000 Spectrophotometer

LICO Spectral Colorimeter

SL1000 Portable Parallel Analyser

HQd Meters and Probes

AT1000 Automatic Titrator

Hach Turbidimeters

Test Kits and Test Strips

Be Confident With

HACH SERVICE

Reduce equipment downtime.

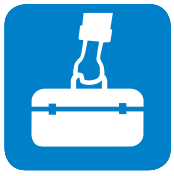
Ensure accuracy with regular maintenance.

Repair instruments faster with priority response.

Be confident.

There is much to be gained by having your instruments serviced directly by the company that designed them. Over 250 Hach Service associates confidently offer support in 22 countries throughout Europe applying their certified expertise to over 240 Hach instruments – ensuring your equipment stays as good as new. Our experience is truly unmatched. Reduce your risk and set yourself up for success with Hach Service.

All of our Service Programs provide you with:



Regular factory-recommended preventative maintenance visits

Verification of instrument performance and operational reliability improvements (e.g. software updates, hardware changes)

Inspection protocol for your quality management

Certificates according to international ISO standard

Hotline support for all technical questions

EXPERT ANSWERS. OUTSTANDING SUPPORT. RELIABLE, EASY-TO-USE PRODUCTS.

Let Hach help with water applications throughout your entire chemical plant or refinery:

- **Influent Water Treatment**
- **Condensate**
- **Boiler Feed Water**
- **Cooling Water**
- **Channel Monitoring**
- **Wastewater**

For more information, visit hach.com/chemicalguide

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