

water testing



Water is precious

Total water testing solutions

ThermoFisher
SCIENTIFIC

Customer testimonial

“

We recently looked at the possibility of replacing some of our glassware with Teflon and plastic products. We contacted Thermo Fisher and they arranged a meeting with us to showcase their range of products with the Nalgene representative. They are experienced and know their products very well. They offered us trial products which we used to determine suitability for the tasks. Any questions or issues we raised with them were promptly dealt with.

With this and previous inquiries, the account manager consistently made herself available to understand our requirements and provide specifications, demonstrations and samples which allowed Sydney Water to make the most informed decisions regarding equipment and consumables.

”

Kristine Mobberley
Asia Fahad
Julia Bartlett

Sydney Water Laboratory Managers

Sydney
WATER

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Municipal water supplies

In municipal water systems, water is withdrawn from lakes, rivers, aquifers or reservoirs. Most cities and towns process the water at treatment plants before the water is regularly tested for local EPA (Environment Protection Authority) compliance.

Treated water is then piped to residential homes and businesses. Many sources of water could contain dissolved minerals, organic compounds or live organisms at harmful concentrations. Water that fails to meet the drinking water standards is a potential risk to public health. High concentrations of certain minerals in supplied water can result in quality issues such as unpleasant taste and odours.

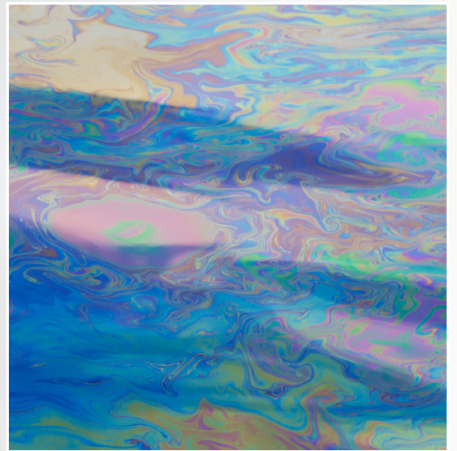
Water quality and safety are required to meet strict standards established in state regulations and legislations, secured via routine tests and treatments (if needed) for potential contaminants.

Municipal water suppliers use a variety of treatment processes to remove contaminants from drinking water. Tap water quality regularly makes headlines when the water source, a treatment system failure, or broken pipes cause compromised water quality and unsafe for consumption. Contamination can include biological organisms, toxic metals (lead and arsenic), excessive toxic chemicals, medical pharmaceutical drugs, chemicals used to sanitise water (chlorine, aluminium, copper, and fluoride), and bromine.

Online water analysers are used to monitor parameters continuously and optimize the sufficiency and effectiveness of drinking water and wastewater treatments.

Thermo Fisher online measurement systems are installed for the determination of:

- Toxicity
- Dissolved oxygen (DO)
- Electrical conductivity (EC)
- Free and/or total chlorine
- Fluoride
- Nitrates
- Ammonia
- Oxidation-reduction potential (ORP)
- pH
- Pressure & flow
- Temperature
- Total solids
- Turbidity
- UV percent transmittance (UVT)
- Total organic carbon (TOC)



Drinking water quality

Drinking water quality monitoring helps to understand the entire water supply system, including the hazards and risks that are present, the performance of treatment barriers, and the integrity of the distribution system (Australian Drinking Water Guidelines 6-2011).



Natural water monitoring

Natural water monitoring requires remote mobility, high reliability of accurate data collection when power is short in supply, service is expensive and human errors are inevitable. Thermo Fisher provides a wide range of field testing means that guarantee durability and ability to withstand harsh weathering conditions and deliver reliable in-situ testing results.

- Portable electrochemistry meters (pH/ORP, Turbidity, Conductivity, DO, ISE, Salinity)
- Water sampling bottles, testing toolkits, reagents & personal protective equipment
- Battery powered water level loggers (CTD – Conductivity/Temperature/Depth)
- Solar powered telemetry data loggers (multiple SDI-12 sensors connection)
- Water level meters & tapes (borehole)
- Field test instruments for biological indicators (Algae, Total Chlorophyll, Cyanotoxins, Unbound Phycocyanin)
- High precision IECEX pressure transducers & transmitters
- Battery operated multi-parameter sondes for water quality (pH/Conductivity/Temperature/ORP/DO/Depth/Turbidity), level & flow meters
- Doppler ultrasonic flow & velocity sensors

Lab testing

From benchtop devices to sophisticated analytical systems, Thermo Fisher has the solutions for every lab, everyday applications.

Laboratory testing methods to determine:

- Anions & cations
- Biochemical oxygen demand (BOD)
- E. Coli, Coliforms & enterococci
- Legionella bacteria
- Haloacetic acids (HAAs)
- Heavy metals
- Bromate
- Perchlorate
- Polycyclic aromatic hydrocarbons (PAHs)
- DNA sequencing

Reagents and chemicals are equipped with paired testing methods. Refrigerated incubators culturing samples for water and wastewater protocols as well as water purification systems are available for laboratory customers.

Wastewater management

Wastewater management is conducted properly and carefully through sewage treatment processes. Treated recycled water, known as effluent, can be reused under certain circumstances. There are five basic process in wastewater treatment.

Pre-treatment is the first step includes the physical separation of solids from the flow by screening grinding debris and settling out heavy inert grit.

Primary treatment utilizes gravity to remove some of the total suspended solids (TSS).

Secondary treatment comprises biological nutrient removal (BNR) processes that use microorganisms to digest the organic material that remains after primary clarification.


Thermo Fisher solutions help customers to determine key process parameters including:

- Total suspended solids (TSS) / Turbidity
- Nitrite & nitrate
- Inorganic anions (Cl, SO₄, F)
- Perchlorate (ClO₄⁻)
- Total cyanide
- Metal cyanide complexes
- Hexavalent chromium Cr(VI) compounds
- Sub-µg/L bromate
- Disinfection byproduct anions & bromide
- Trace concentration of oxyhalides & bromide
- Dissolved oxygen (DO)
- Oxidation Reduction Potential (ORP)
- pH levels

Tertiary treatment includes bacteria and BOD removal, nitrification/de-nitrification, ammonia stripping and phosphorous precipitation if a system discharge permit is required.

The disinfection is needed to destroy harmful organisms in the wastewater effluent and it is commonly achieved through chlorination, polishing ponds, ozonation and UV radiation.

- Temperature
- Ammonia (NH₃)
- Total organic carbon (TOC)
- Total phosphorus (TP)
- Total nitrogen bound (TNb)
- Total oxygen demand (TOD)
- Chemical oxygen demand (COD)
- Algae
- Hydrogen sulphide (H₂S)
- UVT/UVA
- Flow rate
- Pressure/level



Industrial grade pressure and temperature measurement solutions built for high accuracy standard and meet the challenges in waste water management, such as low pressure areas, no power available, in contact with violently moving debris, explosive atmospheres, unknown chemicals and silting.

Agriculture, aquaculture and environmental services

The environment is constantly changing as a result of increased human industrial and agricultural activities, and environmental regulations and analytical methods must keep apace.

Adapting to change requires some effort but also presents opportunity. As regulations change, environmental laboratories can update outdated technology, adopt more-efficient sample preparation procedures, optimise common laboratory practices and reduce operating costs. Thermo Fisher offer the most up-to-date technologies from the world's leading manufacturers and supply an extensive range of testing, measurement, monitoring, control devices and associated consumables to global customers in 150 countries.

Thermo Fisher foster partnerships with global leading technology suppliers to create farming excellence and increase agricultural productivity and profitability.

Multi-parameter monitoring significantly lowers costs by eliminating the need to purchase multiple instruments.

- Soil sampling
- Polar pesticides analysis
- Irrigation monitoring (pH, flow, soil moisture, algae ...)
- Biogas levels (methane CH₄, carbon dioxide CO₂, hydrogen sulphide H₂S, Oxygen O₂, ammonia NH₃, carbon monoxide CO, Hydrogen H₂)
- Solar powered multichannel data logging
- Telemetry with robust enclosure designs suitable for outdoor installations

Environmental laboratories need an integrated data management solution that guarantees adherence with SOPs and delivers defensible and traceable data. Thermo Scientific™ Integrated Informatics increases lab productivity while helping clients to comply with the latest regulatory requirements.

Find out more at thermofisher.com.au/integratedinformatics



Aquafarming has grown dramatically over the past decades to meet rising demand for high-value protein-rich seafood in the Asia-Pacific region. New species will enter the commercial market each year along with increased production of established species, water quality monitoring and effective water treatment become the key links to accommodate the high feed inputs, growth rates and stocking densities required for financial viability and environmental sustainability.

Specialty areas include:

- Remote & tank water quality analysis (pH & alkalinity, dissolved oxygen, conductivity, suspended solids, coliform, Ammonium nitrogen, CO₂, N₂, BOD, organic bacteria & virus)
- Aeration systems (nano bubbler)
- Marine research & monitoring (nutrient runoff)
- Contaminated/remediation site treatment
- DNA sequencing diagnosis of bacteria disease or parasitic infestation from water samples
- Submersible sensors and data collection
- Equipment rental programs and services

Industrial process water treatment

The purpose of optimizing industrial water treatment is to facilitate the manufacturing process, reduce costs and waste or even incorporate process water into a manufactured product. Together with global strategic partners, Thermo Fisher enable ANZ customers the direct access to proven water technologies and the latest technical innovations. Continuous, on-line monitoring is essential to ensure the water quality is satisfactory to a boiler, cooling, purification, recycling, wastewater discharge and other industrial processes. Process water requirements vary depending on the plant applications.

Boiler water

Corrosion caused by Carbon dioxide and oxygen, frequent blowdown due to suspended solids, and damages made by erratic chemical dosing are main concerns to boiler efficiency. Thermo Fisher online monitoring solutions help to minimize the risks and maximum the installation life cycle.

- Water quality monitoring (pH, DO, SC, CC)
- Gas/steam monitoring (CC, Si, Na, SC, PO₄, O₂)
- Pressure measurement at high temperature
- Flow & level control
- Air flow monitoring

District heating water

The most common issues with district heating installations are corrosion, leakage, and bacterial growth. These problems are caused by oxygen, salts, and mechanical impurities in the water. Reliable measurement and treatment ensure trouble-free operation and optimum economy.

- Water purification system
- Salinity, turbidity, pH process analysers

Process water refers to water which is not considered drinkable and is used in connection with industrial plants and processes in production facilities, heat and power plants. Extensive treatments are required for process water such as softening and demineralization, particularly for industries using large amounts of water produce commodities such as paper and pulp, chemicals and refined petroleum, food and beverage, primary metals and automotive, textiles and so forth.

Ingredient process water

Water to be directly used in products often requires additional treatment to ensure the safety, quality and sometimes the appearance of the on-shelf goods.

Typical testings include:

- Moisture level monitoring & analysis
- Trace amounts of contaminants & compounds in water

Rinse water

Rinse water is traditionally used in bath operations in electronics, plastics, glass, electroplating, pharmaceuticals and textile industries. Water usage and cost of operations can be reduced by closely monitoring

- Conductivity
- pH
- Temperature
- UVT

Cooling water

In order to remove heat from heat-producing equipment or processes, cooling towers and evaporation condensers are introduced. Refineries, steel mills, petrochemical plants, manufacturing facilities, food plants, large buildings, chemical processing plants, and electric utilities all rely on the cooling water system to do its job. Parameters below to be monitored to assess and predict corrosion behaviour of the system.

- Chloramine (NH_2Cl) & Chlorine (Cl)
- Oxidation-reduction potential (ORP)
- Suspended solids
- Temperature



Water sustainability and management

Water management is vital to sustain adequate supply under key challenges such as population growth, environmental degradation, climate change and variability, drought and pollution. The environmental sustainability continues to focus on improving energy efficiency, reducing natural resource usage and waste. Thermo Fisher enable customers to make the world healthier, cleaner and safer by adapting to the world emerging technologies that help improving water use efficiency and productivity.

From sample collection, preparation to laboratory water purification, sample quality testing, DNA and trace elements analysis, Thermo Fisher offers a complete range of lab instruments, chemicals, general labware as well as LIMS cloud solutions to facilitate implementation of routine water testing and significant research projects.

Thermo Fisher also offer industry leading techniques for long-term remote water monitoring and data collection, online multi-parameter monitoring for water and wastewater treatment process, impact evaluation of

ambient scent as well as smart sensor network for pipeline monitoring.

From drinking water safety to wastewater treatment processes, our customers can rely on Thermo Fisher solutions to deliver value and help them achieve water analysis goals.

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* Brand and product availability may vary by country, please enquire for more details.



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