



# Quality Control Instrumentation

FOR THE FOOD AND BEVERAGE INDUSTRY

xylem



For over a century, Xylem's well known global brands have served the food & beverage market.

We offer deep application expertise from decades of leading innovation with products, systems and services that address the full cycle of food and beverage production.

Our products are sold into more than 150 countries.

Working in true partnership with our customers and end users, we listen, learn and adapt to local environments, delivering solutions with more impact than ever before.



# Welcome

Increased concerns over safety, quality, and sustainability are just three of the many issues impacting the food & beverage industry.

Xylem's focus is to help solve these challenges by providing innovative, cost-effective product solutions and services that makes the job of delivering safe, high quality, consistent food products an efficient process.

Thank you for your interest in Xylem and for reviewing our Food & Beverage Analytics brochure highlighting just a small part of our product offering. We encourage you to contact us with any questions, concerns and comments.

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## This brochure gives you more.

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[www.xyleminc.com](http://www.xyleminc.com)



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Corporate videos

# What can Xylem do for you?

Xylem's analytical involvement spans right across the food and beverage cycle; monitoring the water used to irrigate the crops we grow in the field, within the production and cold chain distribution processes right through to the consumer.

Quality control, food safety and efficient processing is paramount at every stage; Xylem helps satisfy this need.



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Analytics video

## Optical Analysis

Refractometers

Polarimeters

Spectrophotometers

Photometers

Dissolved Oxygen

Turbidity

## Chemical Analysis

Titration

Karl Fischer Titrators

pH Electrodes

Conductivity Electrodes

Biochemistry Analyser

GC Detectors

Purge & Trap

TOC Analyser

VOC Analyser

## Physical Measurement

Precision Thermometers

Temperature Data Logger

Humidity Data Logger

Pressure Data Logger

Oil Quality

Viscometers



Water



Livestock & Aquaculture



Fruit & Vegetables



Flavours & Essences



Sugar



Edible Oils



Bottled Water



Soft Drinks

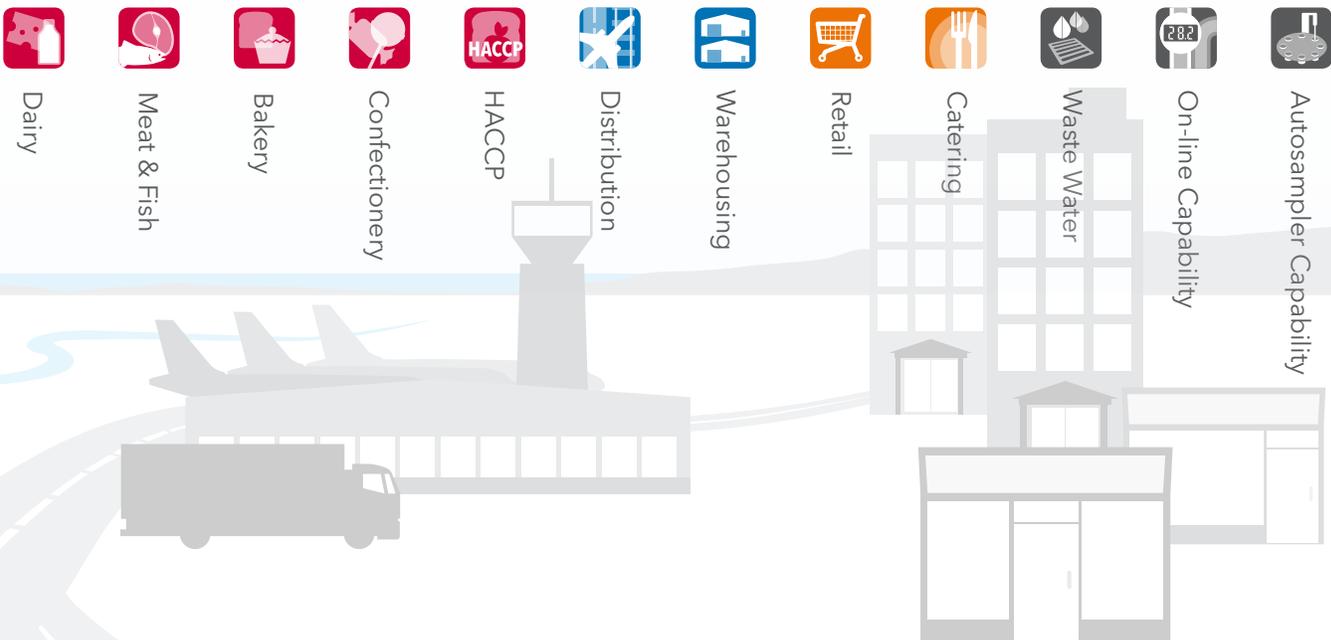


Wines & Beers



Canning

Raw Materials						Processing and Packing									Cold Chain and Fleet Management		Retail and Catering											
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# Water

Water is the lifeblood of the food and beverage industry. In fact, up to 70% of fresh water usage around the World is in agriculture, much of which is for food crops. The quality of any key ingredient is critical, and Xylem has a full suite of water quality, flow and level testing and monitoring products from the WTW, YSI, SI Analytics, Sontek, and OI Analytical brands.

Xylem's WTW and YSI brands are leaders in water quality measurement instruments. Hand held instruments used to measure a wide range of parameters, including pH, conductivity, temperature, TDS, and DO are used to test irrigation channels, wash-down water, retention ponds, and in hydroponics.

In addition, the IQSN system is used to ensure waste water treatment facilities at food and beverage processing plants meets discharge requirements. The SONTEK-IQ series instruments are ideal for monitoring flow in canals, culverts, pipes and natural streams used for irrigation, while the MJK MAGFLUX flow meters are ideal for in-process flow measurement.



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### MultiLine Multi-meter

MultiLine single and multi-channel portable meters are perfect for measuring oxygen and other parameters on-the-go. IDS technology permits simple connection and auditing of any compatible sensor connected such as the optical FDO925.

## TOC Analysers

### Aurora 1030 Series



Applications:



The Aurora 1030 line of TOC Analysers process aqueous and solid samples for total organic carbon (TOC), total inorganic carbon (TIC), and non-purgeable organic carbon (NPOC) content of the samples. The Aurora 1030 series supports a variety of standard methods including USEPA, ASTM, DIN/ISO/CEN, USP, and EU methods.

- Heated persulphate & combustion oxidation technology
- 2 ppb C to 30000 ppm C (heated persulphate)
- 0.05 mg C to 50 mg C (solids)
- 100 ppb C to 30000 ppm C (combustion)
- Simple touch-screen display
- Optional autosampler (aqueous samples)



# Livestock and Aquaculture

Rapid population growth and an increased awareness of health benefits associated with seafood is projected to increase the global demand for seafood by 24%. The aquaculture industry will be required to fill the supply gap with an additional 20-30 million tons of seafood. Our focus is to provide innovative, cost-effective products that make running a sustainable and efficient aquaculture operation as easy as possible.

Our instrument set for aquaculture includes pHotoFlex pH and TURB colorimeters with integral pH correction and over 135 pre-programmed methods including CO<sub>2</sub> and Nh<sub>3</sub>, refractometers for rapid salt content measurement and a number of submersible sensors for temperature, pH, conductivity, dissolved oxygen amongst other parameters, the latter capable of being interconnected to form a control system.

Meanwhile, on the farm, refractometers are commonly used to determine the quality of colostrum fed to new born calves, foals and lambs so that they have a better chance of surviving the critical first days of their lives and of course, portable pH and conductivity meters monitor effluent levels and the quality of pond water down stream of any large scale farm.



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### Wireless Sensors

EcoSense single parameter Pen meters for ORP, pH or conductivity are cost effective hand held instruments ideal for monitoring the condition of ponds and fish tanks as well as for use in wash down water.

## Dissolved Oxygen ProODO

Applications:



The most important measurement in aquaculture is dissolved oxygen, and YSI's ProODO is the best handheld optical DO instrument on the market. It's combination of versatility, field worthy durability, and data management is second to none.

- Optical DO for consistent results
- No membranes, anodes or cathodes to maintain
- Fully waterproof (IP67) and drop tested to 1 meter





# Fruit and Vegetables

The manufacturing process starts with raw materials, whether grown in the fields or imported as dry or liquid ingredients from suppliers around the World.

As well as providing premium quality, German made pH, conductivity, temperature and turbidity meters that are used right throughout the production process, OI Analytical GC detectors commonly analyse a number of raw materials for authenticity and pesticide residue and latest technology YSI 2900 series analysers play an important role too.

However, one of the most used instruments is undoubtedly a refractometer that determines the °Brix of sugar containing foodstuffs. A refractometers use to monitor fruit ripeness on the trees is paramount as farmers are later judged by sugar content at point of sale to supermarkets and cooperatives with °Brix being an important payment factor alongside quantity, colour and microbiological factors.



SCAN or CLICK  
to read about sugar  
in potatoes

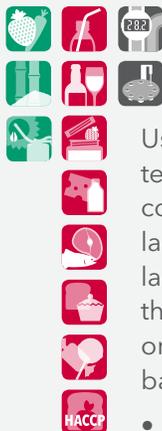


### OPTi Refractometer

OPTi refractometers are used commonly to test fruit and vegetable ripeness. Digital readout, -HAL- light protection and AG Test mode ensures reliable readings time after time.

## Biochemistry Analyser 2900

Applications:



Using YSI's highly accurate biosensor technology, the 2900 measures up to 2 compatible chemistries such as glucose, lactate, glutamine, ethanol, sucrose, galactose, lactose or choline. Typical applications include the measurement of sugars in stored potatoes or tomatoes as well as potato and tomato based products such as fries & ketchup!

- Very accurate results in under 1 minute
- Flexible sampling options including 96 well-plate
- Widely accepted quality check
- Anti-clogging fluidics





# Flavours and Essences

Notwithstanding the water quality being of primary importance in the food we choose to eat, flavour is undoubtedly the most important contributor to our food choice. Flavour is decided at the start of food production with sources being selected for quality and price.

Flavours may be animal, vegetable, mineral or even synthetic derivatives and can be processed as fresh, organic, dried, water and emulsion or oil based product and supplied to food manufacturers further down the chain.

Accurate and reproducible quality control plays an important role. Refractive index by RFM900 wide range refractometers, optical rotation by ADP600 polarimeters and water content using the most accurate TitroLine KF7500 titrator are vital to the process, with special titrations for ketones, aldehydes, esters, lactones, halogenides, amines and peroxide value being made by the latest technology TitroLine titrators.



SCAN or CLICK to see our VOC - 4100 autosampler video



### HandyLab 7 Series Meters

Robust portable instruments for pH, conductivity and dissolved oxygen with digital *Memosens* technology that automatically detects sensor type and negates electrode calibration on exchange. Ideal for use in factory or field, especially when fitted with a SteamLine long lasting pH electrode!

## 5383 PFPD

### GC Detector

Applications:



OI Analytical's patented 5383 Pulsed Flame Photometric Detector (PFPD) excels at selective, high sensitivity detection of sulphur, phosphorus, and other elements. The 5383 PFPD provides a 10-100x increase in signal-to-noise and a 10x increase in selectivity over traditional Flame Photometric Detectors and requires significantly less maintenance and gas to operate.

- Superior sensitivity and selectivity for sulphur and phosphorus vs. conventional FPDs
- Inherent self-cleaning design completely eliminates soot formation
- Quick & easy calibrations
- Long-term stability and minimal maintenance



# Sugar and Edible Oil

Juice and oil extracted from vegetables and root tubers in the form of sugar liquids and oils is an essential component of the food industry and many of the processes and analytical methods used within are common.

High accuracy Peltier temperature controlled RFM340+ refractometers running at elevated temperatures are used to establish blend ratios of oils for food use including palm, corn and sunflower etc. and also for the control of biodiesel. When fitted with flow cells RFM700-Flow refractometers and ADS420 saccharimeters from part of a high accuracy sugar purity system used for processing and payment of sugar beet and cane, forming one of the lowest cost purity systems on the market.

TitroLine titrators offer some unique analyses. The KF 7750 Karl Fischer model is used to establish water content of oils, whilst other chemical titrations are achieved using TitroLine models. pHotoFlex and pHotoLab photometers also play an important role in chemical analysis.

OPTi hand held refractometers measure sugar cane in the field and when fitted with an ethanol scale, are used as a simple control tool alongside the YSI 2900 analyser that is capable of accurately measuring ethanol content during fermentation of corn mash in less than a minute. RFM300+ refractometers can also be programmed to directly display °Brix, Refractive Index, HFCS and even Iodine Value in sugar and oil plants.

pH is critical to sugar production as too is the ash content, calculated from a conductivity measurement. Measurements may be taken in-line or with SI Analytics' HandyLab Mk II hand held or ProLab laboratory meters, with loLine electrodes offering robustness for longevity.

## Capillary Viscometry

Although mainly used in the petroleum and polymer sectors, SI Analytics' capillary viscometers are commonly found within the food and beverage industry; especially in the edible oils and gelatin processing sectors.



## Saccharimeter

### ADS Series

Applications:



ADS Saccharimeters are application specific polarimeters designed primarily for use the sugar industry. The ADS400 Series offer simplistic, cost effect temperature compensated measurement whilst the latest ADS600 Series instruments combine sodium and NIR wavelength measurement in a single instrument with touch-screen and Peltier options.

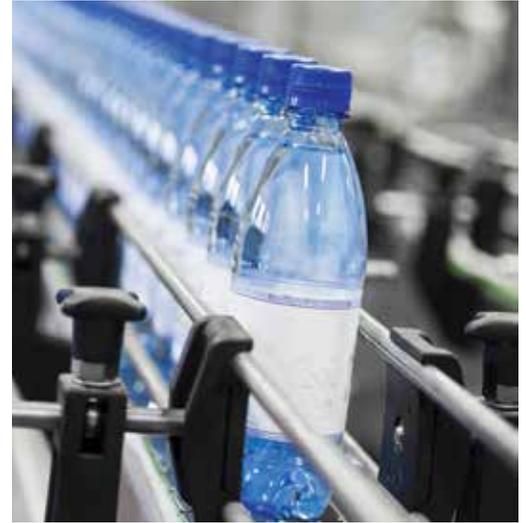
- High accuracy °Z results in accordance with ICUMSA
- Simple ADS400 Series LED models with PC purity
- Dual wavelength, high accuracy ADS600 NIR models
- ICUMSA temperature correction and Peltier control option on ADS600 Series with flow accessories

# Bottled Water

Whether it be the result of the perceived health benefits associated with drinking bottled water, through fear of contaminated ground supplies in certain parts of the World or simply for convenience, consumption of bottled water is at an all-time high. Bottled water comes in many guises; however, no matter if marketed as purified, natural spring, mineral enhanced or finely flavoured water; they must all comply with strict regulations pertaining to naturally occurring trace compounds such as salt, mineral and heavy metal content.

Although the TitroLine 7000 titrators measure titration of ions, alkalinity (carbonate and bicarbonate hardness), chloride, total hardness (calcium & magnesium); many analyses are best served using a pHotoFlex 430 TURB as its on-board library of over 135 water methods combined with integral pH and turbidity functions enables convenient analysis from a single instrument. Analyses include free & total chlorine, alkalinity, hardness, calcium, chloride, fluoride, iodine, iron, magnesium, manganese, nitrate, phosphate, potassium, sodium, sulfate, TOC, TN, and more. pH, conductivity and dissolved oxygen measurement is serviced by a number of brands including the WTW IDS range.

For production environments, OPTi hand held or RFM700 Series laboratory refractometers are used to control fine flavours added to mineral waters and the simple, compact YSI 900 free and total chlorine colorimeter is ideal for checking cleaning fluid cross-over after CIP.



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to see our InoLab  
IDS video

## **pH Electrodes ScienceLine**

ScienceLine electrodes provide the highly stable accurate results demanded by food scientists today. ScienceLine electrodes vary by shape, length, diaphragm & glass types and include standard pH, ion-selective indicator, single and combination versions; all individually certified against a unique serial number for traceability.



## **IDS Lab Meters**

Single, dual and three-channel laboratory meters that combine high precision pH, ORP, ISE, conductivity or dissolved oxygen measurement with Intelligent Digital Sensor technology (IDS) and Quality Sensor Control (QSC) for efficient operation, calibration and documentation in accordance with GLP.





# Soda

Carbonated soft drinks (sodas) and mixed juice drinks form one of the largest single sectors of the food and beverage industry. Made up from a blend of expensive flavours, natural and synthetic sweeteners and unique ingredients including caffeine and preservatives; not only does Xylem's recognised products offer significant food safety and quality control auditing, it importantly provides the tools to ensure production yields are maintained so that costs and profits are kept in check!



Particularly RFM300+ series refractometers are used throughout beverage production from development, to syrup blending, interface detection, dilution control to final quality checking; the latter often automated alongside a TitroLine 7000 titrator that provides both diet dilution control as well as acid content monitoring.

With over 80% of a soft drink being water, controlling it is essential! Although simple photometers like the YSI 900 provide an indication of foul tasting chlorine, the pHotoFlex pH TURB offers additional analyses including chloride, ammonium, calcium, fluoride, iron, magnesium, hardness and more; whilst other more complex analyses such as TOC, VOC, cyanide & nitrate content is determined using instruments from the OI Analytical product range. Titration facilitates additional analysis of final beverage product such as ascorbic, malic, phosphoric and citric acids as well as sulphite, potassium and general acidity or alkalinity including ascorbic acid content (vitamin C).



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## Refractometer

### RFM300 Series

#### Applications:



Since launching the first commercially successful digital refractometer back in 1980 and having constantly evolved, the RFM series of refractometers made by Bellingham + Stanley have become the most favoured means of controlling the blend ratio or concentration of many the Worlds most respected food and beverage brands. Latest models provide extremely accurate results whilst maintaining the need for robustness and simplicity for factory use.

- Highest accuracy ( $\pm 0.01$  °Brix)
- Latest HD display with USB/LAN interfaces
- Rapid Peltier temperature control
- Flattest sapphire prism and dish





# Fruit Juice

A fruit juice is defined as a pure mixture of fruit and water and as such regulation protects its authenticity and fruit content; for example in Europe the concentration of orange juice must be no less than 11.2% and in the USA not less than 12% with no added sugars, sweeteners or artificial flavourings allowed. Fruit juice may be supplied locally as freshly squeezed or ready to drink (RTD) formats but in many cases the original juice is concentrated at source, transported and then reconstituted with water in the final country of need. Fruit juice concentration is controlled throughout the process using an RFM refractometer with acid content being made by TitroLine titrator.

Similarly apple, tomato, pomegranate, cranberry and other fruit juices as well as vegetable juices including carrot, coconut and latest "green juice" or SUPA (Supernatural Unleashing of a Plant Assault) are processed, transported and concentrated in the same way.

Fruit juice is a healthy source of key nutrients including sugars, fibres, vitamins, calcium and potassium; especially for children in development countries. Xylem offers key analyses for many of the requirements of fruit juice processors ranging from authenticity and toxicology testing to high performance °Brix and acid analysis.



## Refractometer

### Pro-Juice

The Pro-Juice refractometer overcomes the erratic behaviour of orange juice experienced by manufacturers during reconstitution from concentrate. Clever software and newly applied sample handling & conditioning provide unrivalled measurement reproducibility allowing control tolerances to be set closer to the lower level without risk of compromise; providing an opportunity to improve company profits by increasing concentrate yield.

- Application specific model for orange juice
- Improve concentrate yield and profit!
- Integral sample conditioning
- Conventional °Brix or orange juice mode



SCAN or CLICK to read the Pro-Juice whitepaper

## Titrator

### TitroLine Series

Applications:



Thanks to the highly resolute and precise pH/ mV and deadstop measuring interface, accurate determination of diet beverage dilution ratio is reliably achieved by the TitroLine 6000 auto-titrator. Pre-determined methods for common titrations and interchangeable burettes make for simple and rapid operation within the beverage laboratory. For busy audit laboratories, the premium TitroLine 7000 model is available that may be used with an autosampler. The TitroLine 5000 offers viability for simple applications.

- Clear display ideal for factory environments
- Interchangeable head for multiple titrations
- 15 user methods incl. total acid, ascorbic acid, alkalinity and sulphur dioxide etc.
- Data storage and secure PDF printout



# Wine

Over the past few decades, growth in demand for wine has dictated the need for a scientific approach to viticulture. Farmers continually monitor the sugar content of growing fruit using an OPTi refractometer so that they harvest only when most ripe for delivery to the co-operatives. They in turn make payment against quantity (weight) and quality (Brix, Oechsle, Baume, Probable Alcohol) of the must, often using an RFM712 refractometer like those in California USA, or similar to the automated In-tek PRH Brix/pH wine systems used in parts of Australia, Germany, Spain and Luxembourg.

Monitoring key parameters during fermentation is also critical in creating a quality vintage wine. WTW MultiLine FDO meters monitor oxygen content and pHotoLab spectrophotometers analyse a number of parameters including total phenols (IPT), hydroxycinnamic compounds (TH), colour intensity (CI), tint (T), yellow, red & blue pigment content as well as determination of iron in white wines. Tartaric acid, acetic acid (VA volatile acidity), colour, copper, iron and L-malic acid (LMA) 0,05...3,25 gr/l spectrophotometric methods are also available.

TitroLine 7000 titrators perform multiple analyses within viticulture including free & total SO<sub>2</sub> analysis, total titratable acidity (TA), free sulphurous acid (sulphite), total sulphurous acid (sulphite), volatile acidity VA 0,012 ...0,12gr/100ml as acetic acid, ascorbic acid (vitamin C), reducing (residual) sugars, carbon dioxide, ash & ash alkalinity, calcium & magnesium, chloride (NaCl) and sulphate. pH and conductivity is also measured.



### Mini Data Logger EBI 11

EBI 11 mini data loggers are used to ensure proper and efficient pasteurisation of bottled fruit juice, beer and dairy products. Special adapters facilitate safe use up to 10 BAR and 150 °C with stored PU & F values easily being extracted via a wireless hub.

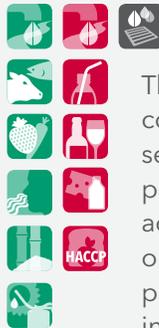
### Chlorine Colorimeter

The YSI 900 is an ideal solution for quick, simple, accurate chlorine measurements and is the perfect replacement for simple colour charts that are commonly used to test incoming water quality prior to production processes. Tablet and powder pack reagents are available.



## Photometer pHotoFlex TURB

Applications:



The portable colorimeter series of pHotoFlex offer more than 135 Standard parameters for water, food, beverage and aquaculture. With optional docking station and pH or Turbidity (IR) measurement, these "real" multi-parameter instruments cover up to three analyses in just one meter!

- Intuitive handling
- GLP compliant data management
- AQA and user defined programs





# Beer and Cider

Brewing beer has been a common process of providing people with a bacteria free, nutritious drink for many millennia and today its popularity as a mass produced beverage is augmented by the latest trend to have locally sourced craft brews; often made with organic ingredients and produced using traditional methods. All beers start with water, base cereals and hops for flavour that when combined with yeast, enable fermentation.

Automatic determination of alpha acids in hop extracts using conductometric titration is paramount for beers to be consistent across brews and the FDA compliant TitroLine 7000 provides this in accordance with EBC 7.4. Hand held refractometers with specific gravity scales are used to control the overall "mash" or "wort" prior to fermentation and the pFotoFlex TURB 430 meters fitted with either a tungsten lamp in Europe or infrared (IR) light source in the USA is often employed in all sizes of production to monitor resulting colloidal suspensions that result from yeast, proteins, polyphenols and even carbohydrates. Turbidity values of beer vary largely between 3 to 5 NTU for pilsner, 5 to 7 NTU for stout, around 10 NTU for ale and up to 15 NTU for lager beers, where 1 NTU is equal to 2 EBC turbidity units.

Importantly the pFotoLab 6600 series spectrophotometers with PL6-BREW package provides many of the other analyses required including bitterness, total polyphenols (EBC method), reduction capacity (potential), anthocyanogenes, colour (EBC & ASBC methods), free amino nitrogen (FAN), steam volatile phenols (smoked malts for smoked beers only), photometric iodine test and TAN (thiobarbituric acid number).

Not only may alcohol content may be determined using the *refractive index & specific gravity method*; the YSI 2900 biochemistry analyser offers additional precision and is ideal for controlling low or no-alcohol beers.



SCAN or CLICK to measure alcohol in beer

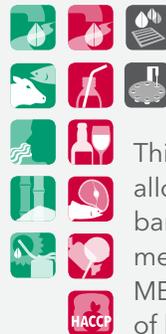
### Alcohol Test Kit

By combining specific gravity and residual sugar on a unique linearly scaled refractometer, alcohol content of finished wine, beer & cider may be achieved to  $\pm 0.5\%$  by volume. Excellent for ferment in bottle and champagne style wines.



## Spectrophotometer photoLab 6000 Series

Applications:



This "All-in-One" photometer allows systematic analysis using barcoded test kits for standard parameters measurement of spectra, kinetics and colour. MEBAK brewery software provides simple analysis of beer using internationally recognized methods.

- QC and AQA options
- User administration
- 200+ standard parameters
- GLP compliant data management





# Canning and Preserves

Preservation of food using simple techniques to prevent oxidation and spoilage caused by microorganisms has been occurring for thousands of years. The addition of oil, vinegar, salt, acids or sugars in potted fruit, vegetables, fish and meat as well as using cooking sauces, ketchups, chutney's and jams is now commonplace and fermentation is effectively used for delivering safe, microorganism free beverage in the form of beer and wine! Dehydration is also frequently used in Asia for preserving egg based noodles, where the prime requirement is to displace water.

Refractometers measure the °Brix or sugar content of soups, sauces, chutneys, jams & jellies as well as the refractive index or blend ratios of oils and vinegars; whilst conversely, the measurement of water content of dried food is facilitated by the volumetric TitroLine 7500 KF.

Pasteurization or sterilization processes are key to delivering safe, preserved food. IP68 rated mini data loggers facilitate both needs with records of PU Value (pasteurisation unit) for beverage producers and calculated F Values used to express the cumulative effect of lethal high/low temperatures and exposure times to ensure microbial destruction within the canning sector being simply provided via wireless data hub and WinLog software.

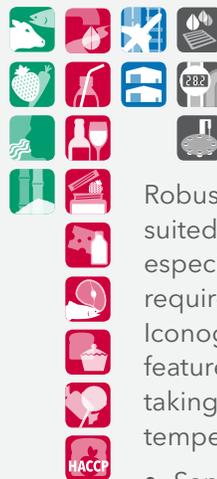


### EBI 11 Pasteurizer

Special adapters allow data loggers to be placed in can or bottles so that they can be passed through the pasteurisers to ensure food safety.

## Refractometer RFM700

Applications:



Robust, fully automatic refractometers ideally suited for use in food and beverage industries, especially where non-skilled operators are required to make critical process actions. Iconography guides the user and a time delay feature provides for stable readings when taking measurements of samples at elevated temperatures of up to 100 °C!

- Sapphire prism in easy clean sample dish
- 0-100 °Brix and user scales
- Fast response temperature compensation (ATC)
- Simple operation for factory use







# Meat and Fish

Processing of meat takes many forms; from fresh to vacuum packed and then to processed foods such as sausages, hamburgers, fish cakes and commonly, ready meals in flavoured sauces. However, in an effort to deliver fresher food to the table, more meat and fish products are being processed and packed in sterile environments so that they may be delivered with lower or no salt or sugar containing preservatives.

Keeping microbiological threats at a distance is the new strategy towards healthier food on one hand and remaining high shelf life on the other. Preparation areas, storage and transport are all part of the cold chain for fresh food delivery, with EBI 25 and EBI 300 data loggers playing an important role throughout the process.

pH of meat, fish and their preserving sauces is important. Penetration style BlueLine 21 pH penetration electrodes with integral temperature and IDS digital technology for use with HandyLab Mk II meters are available as well as three analogue versions that may be used as replacements for existing meters. Conductivity and °Brix measurement is also provided.



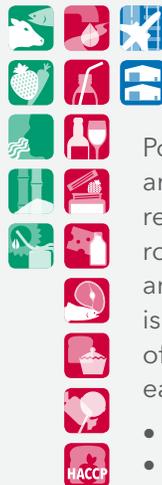
### SSX 210 Salt & HandyLab Mk II pH Meters

ebro's SSX 210 rigid probe may be used to penetrate meat and fish enabling the measurement of salt content by conductivity, just like the new HandyLab Mk II pH meter!

## Refractometer

### Abbe 5

Applications:



Popular within so many food and beverage applications, the Abbe 5 refractometer plays a particularly important role in measuring the fat content of meat and fish during processing. The test sample is simply dissolved in an aggressive solvent of known RI after which the fat content is easily calculated. Ideal for academia!

- Simple low cost model
- Full Brix & wide RI scales
- Integral digital temperature display
- External Peltier option





# Bakery

Whether baking bread, cakes or biscuits, the temperature and time spent in the oven is critical if goods are to be consistent between batches. Ebro supply a number of precision thermometers and data loggers for measuring oven temperatures within the bakery sector. Ebro's TLC 700 core thermometers are used to penetrate cooking dough and finished bread and cakes during experimental research so that internal temperatures can be assessed. Meanwhile, when fitted in a protective case, the EBI 40 oven logger system may be used in pizza ovens and the like so that up to 12 sensors can assess heat distribution within standard and conveyor belt ovens.

OPTi digital hand held refractometers measure the concentrations of tomato pastes on pizzas as well as jam and cream fillings in biscuits and cakes so that consistency is maintained.

Titration plays a part too. The TitroLine 5000 provides for simple acid titrations such as acid in Sauerteig, a popular German sourdough bread, as well as salt and hydrogen carbonate in regular dough. Sulphites (SO<sub>2</sub>) sometimes used as an anti-oxygen stabiliser in dried ingredients that are added to baked products is also achieved; whilst Karl Fischer titration is used to measure dry substances.

Finished cakes such as muffins may also be tested for dextrose and sucrose content using the YSI 2900 analyser and are unaffected by colour, turbidity, density, pH, or the presence of reducing substances.



SCAN or CLICK to see our titration applications library

### TLC 730 Thermometer

Dual IR and core temperature sensor for multi-role use in bakery and the such like in accordance with GLP and HACCP.



## Titration

### TitroLine 7500 Series

Applications:



The TitroLine 7500 series includes standard Karl Fischer, Trace and the 7750 version for both potentiometric titration and volumetric KF titration. Incorporating the all latest physical and metrological technological attributes of the new TitroLine series including colour display, keypad and intelligent burettes, methods library and more; these instruments offer great versatility in food and beverage environment. The TitroLine series delivers an accuracy according to DIN EN ISO 8655, part 3.

- Versatile & precise
- High accuracy interchangeable burette
- Print to secure PDF
- USB connectivity for mouse, keyboard and more



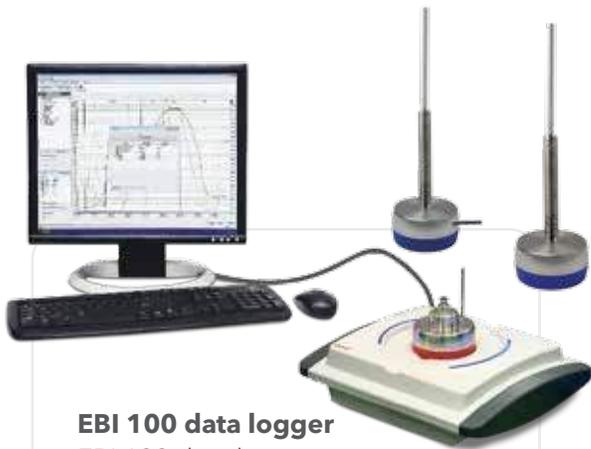
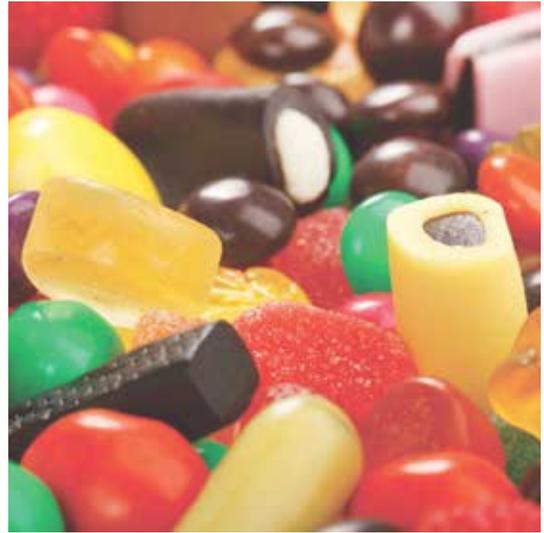
# Confectionery

Confectionery products, also known as sweets or candy, are very diverse in the nature; varying from pure chocolate and complex truffles, jellies, gums, liquorice, toffee and the such like. Raw cocoa, peanuts, sugar and creams make up many centres and how they are processed determines the final texture, stickiness, crispness and taste.

Analysis plays an important role throughout production. Refractometers not only control complex sugar filling concentrations, they also test for fat content of chocolate and cocoa as well as testing the oleic content of peanuts, which when correct increases final product quality and shelf life.

YSI 2900 analysers or ADP polarimeters may be used to test correct ratios of sucrose and glucose blends so that desired crisp, brittle or chewy fillings are achieved with the blends being controlled in the factory by PRH process refractometers fitted to by-pass lines. Gelatine is an import part of confectionery and this is tested by hand held refractometers, YSI analysers and TitroLine 5000 titrators.

During production, cooking temperatures are critical, with some processes taking up to two weeks to dry the product. Ebro EBI data loggers are used in ovens alongside simple hand held TLC 700 thermometers used in the factory. TitroLine KF 7750 Karl Fischer titrators are used regularly to check moisture content of finished nougat, toffee, gums, pastilles and boiled sweets following sample homogenisation or heat treatment to enable the measurement.



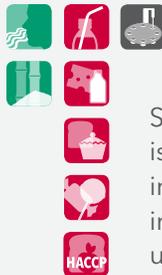
### EBI 100 data logger

EBI 100 data loggers are commonly used to continually monitor critical temperatures during the cooking process of confectionery in manufacture. A data hub provides easy extraction of stored data so that cooking times can be examined and corrected accordingly.

## Polarimeter

### ADP400

Applications:



Sugar blend ratio is very important in the confectionery industry. Polarimeters are used to ensure mixtures of glucose, invert sugars and pure sucrose are correct otherwise final product will not behave like intended - *smooth and silky vs. brittle and snappy!*

- High accuracy low cost model
- Robust design for factory operation
- Choice of sample cells





# HACCP

Food safety is of paramount importance throughout the food chain. Hazard Analysis & Critical Control Points (HACCP) is an internationally recognised system that ensures the food we eat traverses a stringent quality control audit trail. Governments across the globe adopt various levels of HACCP, advising both producers and distributors according to their local needs. Specific methods for dairy, meat, fruit juice and the such like are published and many of the instruments already featured in this brochure play an important role in the procedures.

pH, conductivity, oxygen and most importantly temperature are commonly tested. Pathogen and pesticide residue testing of fruit is very important and is satisfied by the specific GC detectors manufactured by OI Analytical. Titration and spectrophotometry also meet the needs of manufacturers as they inspect goods for incoming residues and contaminants.

Meanwhile out in the field, consumers are protected by food inspectors that perform spot checks to ensure meats and other foods susceptible to microbiological attack using test kits provided by Xylem brand ebro.

As an aside, alcohol in beer, wine and cider is tested by trading standards officers to ensure they do not exceed the declared content; providing consumers with the reliable data they need before making any decisions about operating machinery.



## Food Safety Test and Inspection Kits

The food inspection kit contains the required hand held instruments, data loggers and tools for comprehensive food inspections.

### Kit comprises:

- Frying oil monitor FOM 320
- Laboratory thermometer TFX 422C
- pH meter PHT 810
- Dual infrared thermometer TLC 730
- Temperature data logger EBI 300
- Buffer solutions
- Electrode cleaner
- Knife, tweezers, scissors, magnifying glass, flashlight





# Cold Chain

Cold chain is defined as a temperature controlled supply chain that ensures safe delivery of perishable items such as medicines and foodstuffs. There are a number of stages within the chain stretching from deep within the food processing arena right through to the supermarket shelf but typically cold chain refers to storage, warehousing and long or short haul transport.

Perishable foodstuffs such as fruit, vegetables, dairy, fish and meat require temperature and sometimes humidity or pressure monitoring during transportation from their source to restaurants and supermarkets around the World and this monitoring need is satisfied by our ebro brand.



### DR Digital refractometers

Refractometers check the oxygen and nitrogen build up within cold storage warehouses by monitoring the °Brix of fresh fruit. They are also used in fleet management to ensure radiator antifreeze and diesel exhaust fluids (DEF/\*AdBlue®) are in order.



\*AdBlue® is a registered trademark of the VDA Verband der Automobilindustrie e.V.



# Cold Chain

In order to ensure that storage cases within the cold chain have not been opened or left outside of their thermally controlled environment for any significant time, the latest EBI 300 multi-use or more typically, the disposable EBI 330 temperature data-loggers are used as they are a more convenient solution to ensuring that such critical foodstuffs have not been "thermally abused."

Typical breaches that the EBI 300 can help detect include complete or more dangerously, intermittent failure of air-conditioning plant, delayed transfer between transport media such as truck to plane, insufficient cooling of secondary media prior to transfer and even deliberate attempts by rouge transport companies to reduce fuel costs by raising or even stopping the air-conditioning during the journey.

Configuration and data access is made via a secure web environment that does not require any special software to be downloaded locally; eliminating the need for expensive and inconvenient validation. It's simply "plug & play!"



SCAN or CLICK to go to our EBI-300 configuration website!

## EBI-300 USB Data-logger

### Multiple use models

EBI 300 USB data loggers enable convenient constant monitoring of temperature and humidity of foodstuff during transit so that an audit trail may be reported at reception of goods, ensuring critical food safety parameters have not been breached. EBI 300 Multi-use models are reusable easily configured and have a convenient LCD display. 21 CFR Part 11 (Winlog.basic) DIN EN 12830, ATP, VO (EG) 37/2005 compliant.

- IP65 tamper proof design
- Optional external probes for use in warehouses and supermarkets
- No special software required
- Secure PDF report



### Single use models

The EBI 330 USB single use data logger provides cost-saving continuous temperature monitoring.

Operation is simple:

- Configure via the web portal
- Activate the logger and finally
- Plug the logger in to a PC to get a full report of the data captured!





# Retail

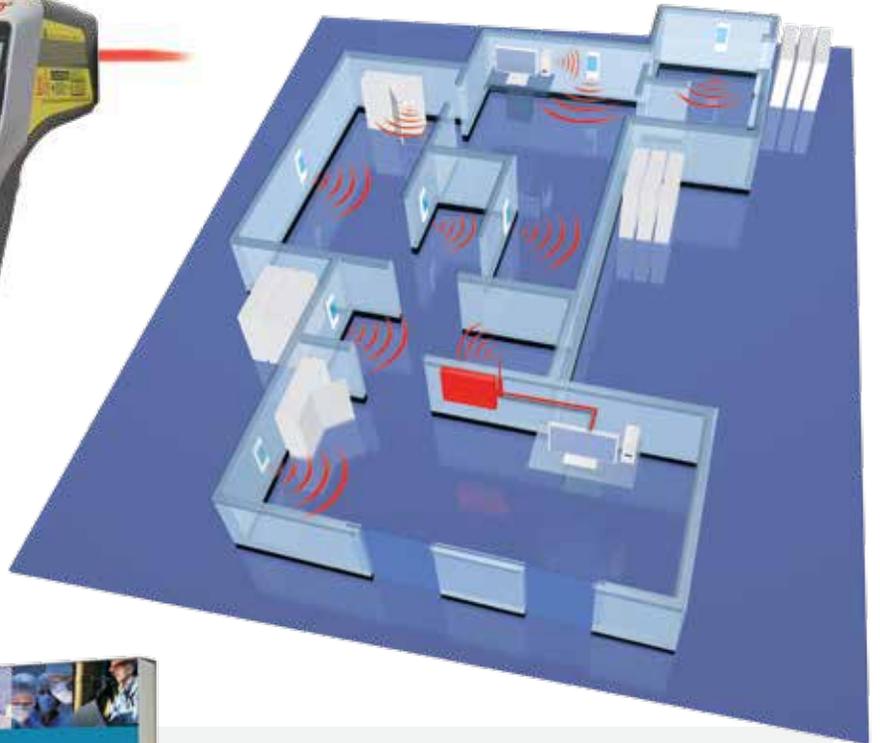
Although most of the instrumentation supplied by Xylem is on a B2B platform, the general public will come into close contact with our products on a daily basis. In supermarkets, wireless refrigeration monitoring triggers remote alarms under fault conditions so that corrective action can be taken immediately in an effort to prevent spoilage and waste.



In smaller scale establishments, standalone data loggers ensure temperature and in some cases humidity levels are not breached, while simple infrared or core thermometers test the temperature thresholds of uncooked meats and cheeses on display.

### Infrared Thermometer TFI 250

Rapid non-intrusive measurement of product temperature is easily achieved using an infrared precision thermometer and ebro offer a choice of models to satisfy this need, including a waterproof model that may be used within harsh working environments as well as others for testing incoming materials or refrigerated goods in storage or on display.



SCAN or CLICK  
to see our  
EBI 25 video



## Catering

Not only do we expect our food to be safe, we like it to taste consistently good and we like it to be delivered in a sustainable manner by way of efficient production, good logistics and therefore low waste. Xylem helps with this need throughout the cycle and even at the very end, our products help deliver consistent, safe and sustainable products.

Whilst hand held refractometers have been commonly used to calibrate beverage dispense systems that combine syrup and locally sourced carbonated water for some time now so that taste is not impaired; nowadays, alongside regular use of core thermometers in the kitchen, chefs even use OPTi refractometers to control the blend of freshly made stock (bouillon), ghee, sauces and soups in an effort to deliver consistency.

And finally with safety in mind, ebro's newest FOM 320 frying oil meters test the quality in commercial deep fat fryers so that our chips taste better and are free from toxic build-up; and savings can be made too by knowing when not to change the oil too early!



### FOM 320

Ensure toxin build up in frying oil is kept to within safe limits and deliver foodstuff in good condition, time after time!

- One button operation
- Rugged sensor protection
- Oil change alarm
- Calibration certificate



SCAN or CLICK  
to visit our  
Convenience  
Store!



### OPTi-Dispense

Ensure post-mix dilution ratios are within specification to ensure product quality and to preserve valuable syrups from being wasted!



# Gerhardt Analytical Systems

## Gerhardt - Distribution in the US and Canada

C. Gerhardt is one of the world's leading suppliers of laboratory equipment and analytical systems for food and animal feeds. For over 160 years, companies have trusted Gerhardt for highly precise and accurate instrumentation.

A family-run business for five generations, Gerhardt has cultivated a close relationship with their customers and works to help them achieve continuously reliable results through unmatched customer support and a strong R&D program. OI Analytical is the exclusive distributor of Gerhardt instrumentation in North America.

Gerhardt instruments are used to analyze fat, protein, alcohol content, nitrogen, crude fiber, sulfurous acids and other components of interest. Engineered for safety and durability, Gerhardt analysis systems offer automated ease of use and meet or exceed the requirements of international standard methods.



Used in a variety of applications including:

- Milk & Dairy Foods
- Beer, Wine, & Distilled Spirits
- Coffee, Tea, Soft Drinks & Drinking Water
- Meat, Poultry, & Fish
- Processed Foods
- Chocolate CHEMtrol system

### **VAPODEST** - Steam Distillation System

The most modern and powerful system on the market for nitrogen analysis using the Kjeldahl method, the VAPODEST® is ideal for the steam distillation of volatile acids, sulphur dioxide, TVB-N, alcohol, vicinal diketones or hydroxyproline. The VAPODEST series offers powerful analytics, accurate results, and efficient, clean operation in one easy-to-use system.

- Easy-to-use touchscreen display
- Kjeldahl analysis complies with standard methods
- Cost-efficient
- Automation options available
- Compatible with a wide variety of Kjeldahl glassware



### **HYDROTHERM** - Automated Acid Hydrolysis

Providing precise, reproducible digestions at a fraction of the cost of traditional methods. This patented technology automates traditional acid hydrolysis, providing rapid, accurate results while decreasing the cost of analysis by 80%. Safer than the Mojonnier method, the system eliminates the handling of hot acids.

- Completely automated and easy to operate
- Analyze up to 6 samples simultaneously
- Meets requirements for international regulations



## DUMATHERM

### Nitrogen Combustion Analyzer

Fast, precise, and cost efficient, DUMATHERM® uses all the advantages of the Dumas combustion method and enables labs to analyze a wide range of samples including those containing saline, high concentrations of water, low concentrations of nitrogen, or highly-concentrated samples. DUMATHERM reduces analysis time to 3 minutes or less, 98% time savings compared to Kjeldahl.

- Fast combustion analyzer for protein analysis
- Fully automated - rapidly analyze a variety of sample matrices including liquids
- Efficient, residue-free combustion
- User-friendly, ISO 17025 compliant software



## SOX THERM - Automated Soxhlet Extraction

The innovative SOX THERM® is a fully automated Soxhlet Extraction System that is 4x faster than the traditional technique. Fast and versatile, the system provides accurate, reliable results with options for 2-6 sample units that may be linked for a total of 24 samples. SOX THERM automates and accelerates traditional Soxhlet extractions, freeing the operator's time for other tasks.

- Cost-effective
- Fully programmable with automatic start up and shut down
- Easy! One button operation
- Automated solvent recovery



## KJELDATHERM - Block Digestion System

Digest up to 40 samples simultaneously and precisely controlled temperatures. Vessels are available in a variety of sizes that can be inserted directly into a VAPODEST system for the distillation step after the digestion is complete, eliminating cross-contamination from sample transfer.

- Ideal for digesting large numbers of samples
- Easily handles foaming samples (e.g. beer, milk) with BS 400-ml tubes
- Automatic sample lift capability
- Precise temperature and time control

# Premium brands – globally recognized heritage



For a century, Bellingham + Stanley has been at the forefront of instrument design and technology and today is regarded by many international brands as the leader in the field of refractometry and polarimetry.

- Refractometers
- Polarimeters
- Certified Reference Materials

[www.bellinghamandstanley.com](http://www.bellinghamandstanley.com)



ebro has been servicing the scientific world with innovative measurement solutions for over forty years and today, customer feedback still plays an important role within the business model. To ebro, customer care not only means supporting existing product and software; it also means being able to provide custom solutions within their field of excellence too!

- Precision thermometers
- Food safety test kits
- Frying oil meters
- Humidity, pressure & temperature data loggers
- Portable digital refractometers

[www.ebro.com](http://www.ebro.com)



Since 1963 OI Analytical has been providing innovative products used for chemical analysis and is a key supplier of sample preparation and turn-key gas chromatography solutions for testing food products and water for chemical contaminants.

Beverage & water analyses include:

- Total organic carbon (TOC), cyanide, NO<sub>2</sub>, NO<sub>3</sub> and more
- Organophosphorus & organochlorine pesticides
- Volatile organic compounds (VOCs)
- Nitrate/Nitrite in milk and milk products

Sample preparation for food and fruit analyses include:

- Pesticides & herbicides
- Sulfur analysis in flavors, fragrances, and edible oils

[www.oico.com](http://www.oico.com)



## SI Analytics<sup>®</sup>

For many years, SI Analytics has been producing innovative electrodes and meters that today has culminated in some of the World's leading electrochemistry instrumentation.

- Titrators & burettes
- Viscosity measuring systems
- Capillary viscometers
- High performance pH electrodes
- pH, dissolved oxygen & conductivity meters

**[www.si-analytics.com](http://www.si-analytics.com)**



Founded in 1948 and formerly known as Yellow Springs Instrument Company, YSI develops and manufactures scientific instruments, sensors and systems that serve a variety of scientific markets worldwide. Particularly for food & beverage, YSI Life Sciences latest 2900 biochemistry analyser measures lactate and ethanol as an indicator of spoilage in ketchup, salsa and other tomato products in less than 60-seconds. The same technique can be used for fruit processing.

- pH, dissolved oxygen & conductivity meters
- Biochemistry analysers

**[www.ysi.com](http://www.ysi.com)**

# Proven brands - service you can rely on



Xylem prides itself on supplying only the best quality products. We source our materials from sustainable sources and design our products for reliability and longevity.

Our brands operate a quality management system in accordance with or similar to ISO 9001:2008 amongst other industry regulatory compliances such as TUV, as well as UKAS for calibration and testing, where ISO 17025:2005 is the industry standard.

Whatever the product, Xylem ensures best practice from start to finish.



Xylem's analytical products are available directly from the manufacturer and from a network of carefully selected distributors to meet the needs of the markets we serve.

And we don't stop there! Once installed Xylem offers preventative maintenance and repair services across the globe. On-site validation is key to performance and our products are supported by a comprehensive range of consumables including reagents, buffers, powder pillows and most importantly; internationally recognised Certified Reference Materials that together, help ensure reliable results, time after time.

## There's a lot more to Xylem

Xylem comprises five growth centres - Treatment, Transport, Dewatering, Analytics and Applied Water Solutions. These businesses are interconnected, anticipating and reflecting evolving needs and sharing their applications expertise to cover every stage of the water cycle.

FAANDERAA<sup>®</sup>

AC FIRE PUMP

Bell & Gossett<sup>®</sup>

BS Bellingham + Stanley<sup>™</sup>

-ebro<sup>®</sup>

FLOJET<sup>®</sup>

FLOWTRONEX<sup>®</sup>

FLYGT

Global Water

godwin<sup>®</sup>

GOULDS WATER TECHNOLOGY

JABSCO

LEOPOLD<sup>®</sup>

LOWARA<sup>®</sup>

mjkl

O-I Analytical

PCI MEMBRANES

REDJACKET Water Products

rule<sup>®</sup>

SANITAIRE<sup>®</sup>

SI Analytics<sup>®</sup>

SonTek

Standard Xchange<sup>®</sup>

WEDECO<sup>®</sup>

Water Equipment Technologies<sup>®</sup>

WTW<sup>®</sup>

YSI

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# Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you: [www.xylem.com](http://www.xylem.com)



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