

Food & Beverage

Analytical solutions in the laboratory



9 News

August 2014

Automated Checkweighing for the Perfect Cup of Coffee

The taste and quality of a cup of coffee, made from brewing capsules, very much depends on the right amount of coffee in each capsule. To ensure consistent quality, a famous European coffee producer invested in METTLER TOLEDO precision balances with check weighing functionality.

This company is world-renowned for its unique and flavorful blends. Every individual capsule must contain the right amount of each signature blend. Too much, and the resulting cup is too strong, perhaps even bitter. Too little, and the resulting coffee is weak and lifeless.

Taking quality control seriously

Quality control is of critical importance at each of the company's five manufacturing plants. During production, the weight of coffee capsules coming off the line is checked every five minutes to ensure consistent filling. The operator randomly selects a predefined number of capsules to be weighed in order to determine net- and average net content. If a deviation occurs, often due to changes in humidity, it becomes necessary to

adjust the filling machines. Not only do machine adjustments cause costly downtime, there is also an additional risk of error in performing the important net content calculations manually. Errors at this crucial stage may result in machines being adjusted unnecessarily.

The existing balances at the company did not allow for high-level customization and this led to accidental settings adjustments. With the aim of ensuring product quality whilst simultaneously boosting productivity, the company sought to resolve these issues with a solution from METTLER TOLEDO.

Automated checkweighing

The company invested in 52 new XP802S precision balances. The XP802S boasts



METTLER TOLEDO



Balance terminal with OneClick™ user interface

the tare storage and automatic tare deduction needed to calculate the content of coffee in each capsule. Now, when a production operator picks the predefined number of capsules from the line for weighing, the XP802S calculates the net and average net content automatically. This statistical quality control helps to ensure any production drift is caught and corrected long before any out-of-spec capsule can possibly reach a consumer's coffee cup.

A productivity boost

The company's management team appreciates the improved production rate, thanks to the XP802S's simple, password-protected graphical user interface that simplifies the checking process and prevents unintentional balance setting changes. Topped off with their rugged design and easy level control, the new

balances have drastically reduced quality issues and given productivity a boost.

The production manager is also pleased to be extending the company's METTLER TOLEDO service contract and looks forward to many more years of fruitful collaboration.

Text: Roberto Tonani
Precision Weighing Product Manager

► www.mt.com/xp-precision

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How Much Sodium Is In Your Food? Just Enough!

Sodium enhances the taste of food, but has to be consumed in moderation. Therefore, measuring sodium content has become imperative for food producers. The new Sodium Analyzer provides a simple and cost effective analytical method.

In recent years, society has become increasingly aware of the dangers caused by excessive sodium intake. Pressure is mounting for food manufacturers to accurately determine the sodium content of their food products. Direct sodium measurement is commonly performed by atomic absorption spectroscopy, ion chromatography or inductively coupled plasma spectroscopy. These techniques demand a significant capital investment, ultrapure reagents plus lengthy sample preparation and system calibration. Therefore, direct sodium determination is often substituted by argentometric chloride titration, which is simple and highly accurate. The results are, however, not comparable due to the interference of other sodium (glutamate, citrate) and chloride compounds (KCl) that are often also present.

A new approach to sodium analysis

The new Sodium Analyzer provides a very simple, accurate and cost-effective tool for the direct determination of sodium. It uses a sodium-specific glass electrode (ISE) and applies a multiple standard addition technique using a built-in dosing burette. Thanks to a special algorithm, developed with Zürich University of Applied Sciences, it delivers accurate and repeatable sodium analysis.

The right tool at the right time

The simplicity and affordable price of the Sodium Analyzer will allow many small food companies to perform their own analyses rather than having to rely on external service labs. Considering the increased public awareness of the health implications of excess sodium intake, the new Sodium Analyzer has arrived just at the right time.

Text: Christian Walter
Head of SBU AnaChem

► www.mt.com/sodiumanalyzer



The new Sodium Analyzer

Multiparameter Beverage Analysis Saves 10 Minutes per Sample

Beverages undergo multiple quality control tests to ensure that consumers enjoy their juices and sodas. Acidity, pH and Brix measurements are the common, daily analyses for beverage producers. METTLER TOLEDO's InMotion™ Autosampler has automated and sped up quality control at Ramseier Suisse AG, a leading Swiss beverage producer.

Ramseier Suisse AG holds a solid position in the Swiss beverage market thanks to selling their own product brands, including Ramseier, Sinalco and Elmer and producing under private label. The strict quality standards in the industry require running several quality control tests before beverages reach consumers.

Tedious multi-instrument testing

The most important QC tests performed

on any beverage before it reaches the market are density, sugar content (Brix), acidity, pH and, for carbonated beverages, the CO₂ content. Originally Ramseier measured all these parameters on discrete instruments and carbonated beverages were degassed using a separate vacuum pump and magnetic stirrer after the CO₂ determination. Although results were accurate, the procedure was time-consuming since several separate

instruments were required in order to perform all these analyses.

All parameters in a single run

Instead of carrying out daily, routine analysis on separate instruments, METTLER TOLEDO demonstrated a more efficient, automated system. This system combines a DM40 density meter, RX50 refractive index cell and a T90 Excellence titrator, all automated with



Mr. Kunz, Quality Manager at Ramseier Suisse AG, in the QC Laboratory



InMotion Autosampler for automated multiparameter analyses

the new and innovative InMotion™ Autosampler. Also the degassing of the carbonated beverages is automatically done directly in the sample beaker.

Low complexity, high efficiency

The system was designed so that the operator only needs to place the samples on the autosampler rack and to choose the product to be measured via the OneClick™ shortcut on the touchscreen of the DM40 density meter. All parameters (pH, acidity, Brix, density, acidity:sugar ratio) are then determined fully automatically. So while the multiparameter system with InMotion™ is doing the routine job, the lab technicians have more time to focus on other specific analyses (e.g. microbiology, vitamin C, etc.)

Even cleaning is simplified. At the end of the day or between different sample se-

ries, the system can be cleaned and calibrated with a single click.

Not only has this single, automated system made testing less complicated, it reduces the total time required per sample. Mr Kunz, the Quality Assurance Manager at Ramseier Suisse AG told us, “With the fully automatic combined analysis we have saved at least 10 minutes per sample and results are highly repeatable.”

With multiple instruments running in parallel, based around the InMotion Flex Autosampler, Ramseier Suisse AG is enjoying increased efficiency and repeatability, easy operation and even a simple cleaning process.

Text: Daniel Buchmann
Density and Refractometry Product Manager

► www.mt.com/InMotion-Beverage





Genetic Testing in Food Pipetting Hints for Better Results

Genetic testing and the utilization of DNA amplification techniques, such as PCR or qPCR have become standard tests in the food industry in order to quickly assess contaminations. Liquid handling plays an important role in the sample preparation process and can either enhance or flaw experiment results.

Genetic testing provides a faster and more precise answer to the question, “What has my food been contaminated with?”. For example, Escherichia coli (E. coli) is a very common bacterium that exists as many different strains, most of which are completely harmless to humans and are part of our natural gut flora. However, there are some strains, e.g. O157:H7, which can be harmful to humans and the quickest and most precise way to identify its presence is to use a genetic test that specifically looks at the unique genetic code of E. coli O157:H7. This test is generally carried out using a DNA amplification technique, such as

PCR or qPCR, to determine the presence or absence of this strain. These tests are quick, accurate and outperform the older, established bacterial identification tests that used to take several days to complete.

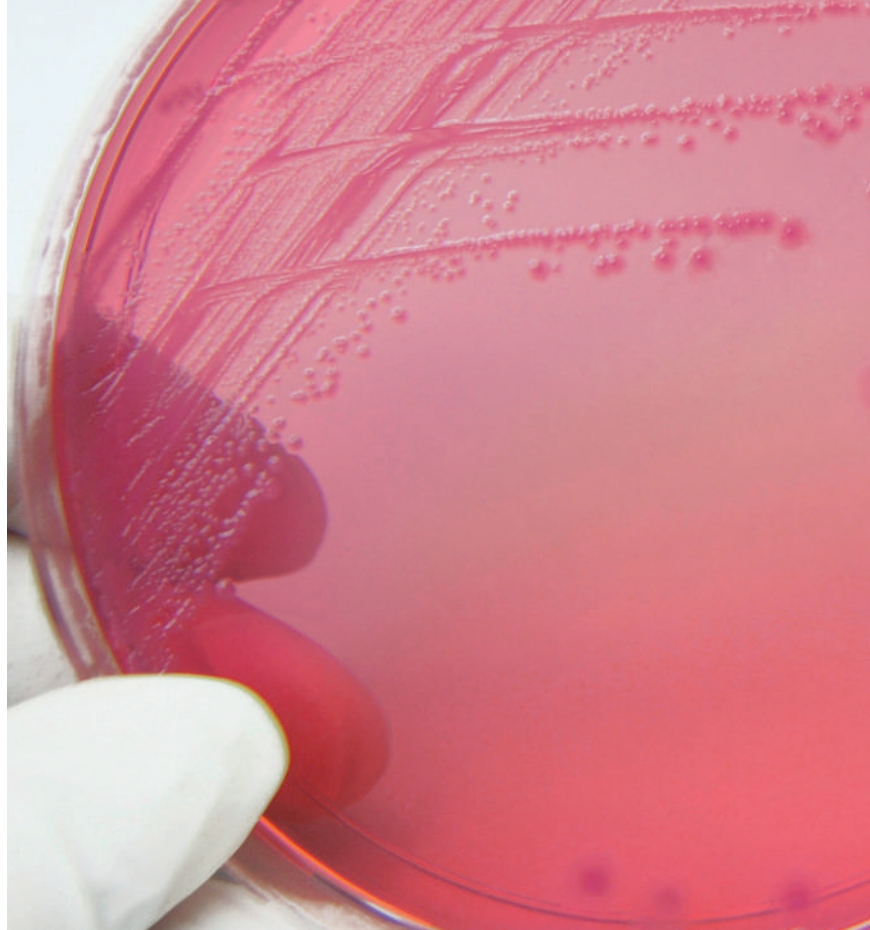
Challenges during sample preparation

However, such genetic tests do require careful sample preparation in order to deliver the correct mixture of reagents for the PCR process. Liquid handling is a significant contributor to this preparation process since errors in pipetting lead to errors in results. The most

common challenges faced when preparing the sample are twofold: Firstly, the need to provide a sterile environment that will not contaminate the PCR process. Secondly, but equally as important, is pipette choice and ensuring the user is trained to pipette accurate volumes of solutions.

Avoid DNA contamination

Using Low Retention tips also reduces the risk of very small volumes of DNA-containing sample adhering to the tip and not being properly transferred. These same tips are also available with enclosed filters. Filter tips prevent any



Left: Low Retention tips recommended for qPCR experiments
Right: E. coli strain on plate

DNA-containing aerosol material from entering the pipette, which could then contaminate future experiments. For these reasons, the use of filtered Low Retention tips is always recommended for qPCR experiments, as they are more sensitive than PCR.

Finally, it is recommended to use Bio-Clean tips in order to ensure absolute cleanliness. These tips are manufactured and packaged in a clean-room environment and rigorously tested for DNA contamination with high sensitivity detection methods using the highly sensitive qPCR technique. This and several

other tests ensure that when the filtered low retention tips are used for qPCR tests they do not add any contaminants of their own which could produce false positive or negative results.

Text: Murray Anderson
Marketing Head Rainin

► www.mt.com/RaininLR

Good Pipetting Practice

Pipetting impacts the success and reproducibility of laboratory experiments.

Join the „Good Pipetting Techniques webinar and improve your pipetting performance.

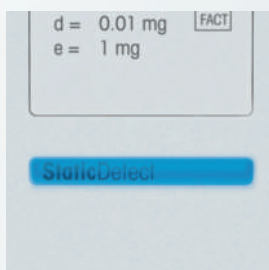
Go to webinar



► www.mt.com/lab-webinar-techniques

Don't Let Electrostatic Charges Influence Your Weighing Results

One of the most common problems experienced when weighing dry substances in a laboratory environment is the influence of electrostatic charges, leading to inaccurate weighing results. The new XPE analytical balance offers a unique technology to detect electrostatic forces, measure its influence in the weighing and eliminate them.



StaticDetect™

Built-in StaticDetect technology warns you when electrostatic charges affect the weighing results above your defined threshold.



ErgoClip™

The ErgoClip basket for plastic and glass tubes shields the weighing pan from electrostatic charges. Small tubes also reduce the risk of creating charges.



FAQ Electrostatic Charges in Weighing

1. What are electrostatic charges?

An electrical charge on the balance or vessel to be weighed causes electrostatic forces. Electrostatic forces can alter weighing results either increasing or diminishing the real weighing value.

2. How are electrostatic charges originated?

Friction is the most common way that electrostatic charges are generated. However, under climate controlled environments, such as the typical analytical lab, charges are more easily generated and lead to greater source of error. Weighing a small quantity of dry sample into a large glass or polymer vessel will also significantly increase the error of the weighing result.

3. How do they influence weighing results?

Electrostatic charges exert forces on the sample to be weighed and the weighing pan, thus causing significant falsification of measurement results. Inaccurate weighing results range from few milligrams up to 100 mg.



Antistatic Kit

Attach the Antistatic kit to the analytical balance and eliminate charges without causing turbulences in the weighing chamber.

Download the 'Electrostatic Charges in Weighing' whitepaper

► www.mt.com/lab-electrostatic-weighing

pH Verification Kit for Reliable and Traceable Results

Regular performance verification of pH meters guarantees faultless routine operation and optimal result reliability. The VPac pH verification kit provides quick and easy pH system performance verification. Get certified results by simply measuring two test solutions of unknown pH value.



Unbiased verification

Two test solutions of unknown pH value are measured for an unbiased verification. This gives extra peace of mind after installation or setup change, and before an audit.



Online evaluation

Get immediate feedback concerning the quality of measurement results. Enter the results for both test solutions on an online verification page and get an evaluation with one click.



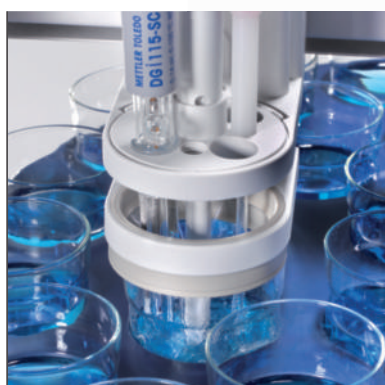
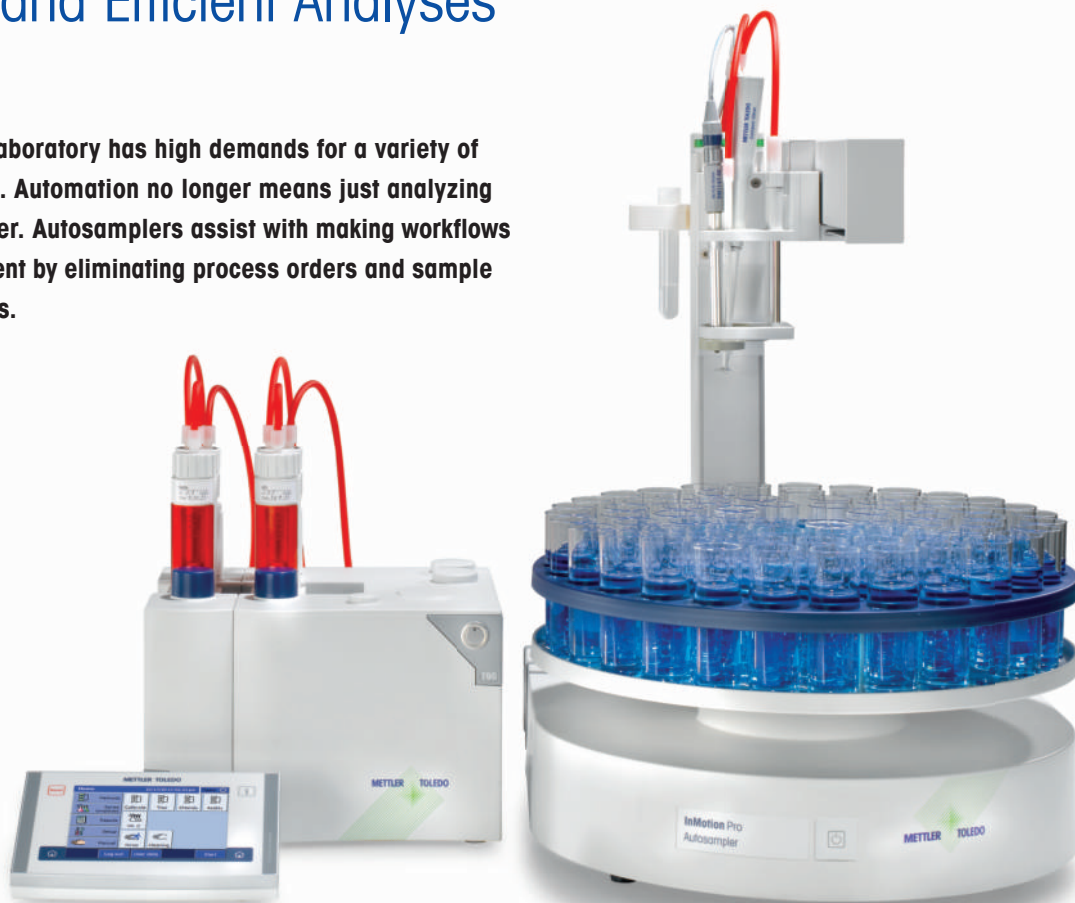
Certified & traceable

Download and print a conformity certificate to document the accuracy of your results. For maximum traceability all test solutions are assigned unique serial numbers.

► www.mt.com/pH-VPac

Put Your Lab InMotion™ for Flexible and Efficient Analyses

Automation in today's laboratory has high demands for a variety of samples and workflows. Automation no longer means just analyzing one sample after another. Autosamplers assist with making workflows more flexible and efficient by eliminating process orders and sample data transcription errors.



Maximum throughput

Designed to maximize throughput in the minimum of space, InMotion autosamplers increase productivity without sacrificing laboratory bench space. The innovative robotic arms of the Pro and Max series reach into the sample tray to optimize space.



Flexible workflows

Intuitive and flexible instrument programming allows sample workflows to be tailored to specific requirements. Whether using PowerShower™ to clean components or more thorough sequences to clean and recharge electrodes, InMotion is here to assist.

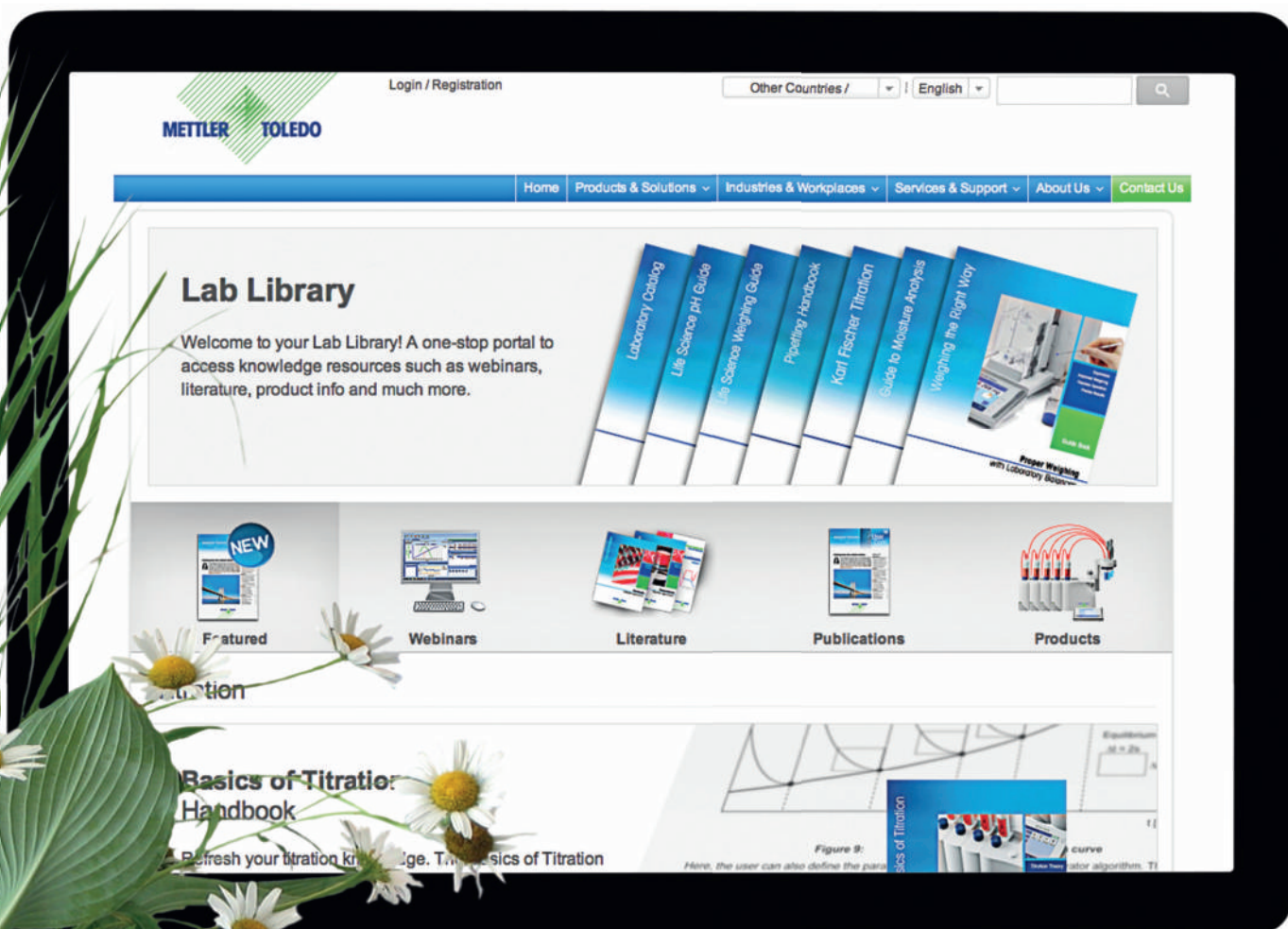


Modular and tailored

Every lab and sample has its own demands. Build an autosampler according to sample requirements with modular boards for extra pumps, CoverUp™ system for protecting samples and operators and water bath sample trays for temperature control.

► www.mt.com/InMotion

Broaden Your Lab Knowledge at www.mt.com/lab-library



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For more information

