Verifying Moisture Analyzer Performance Within 10 Minutes

National Starch, the world leader in specialty starch technology, trusts in Halogen Moisture Analyzers from METTLER TOLEDO. Trust is good, but as for all analysis devices, control is better. SmartCal is the new and quick way of verifying the performance of Halogen Moisture Analyzers.

The manufacturing site of National Starch Specialties (Shanghai) Ltd uses two methods for Loss on Drying measurements. For routine control, and to cope with the large number of samples, the fast METTLER TOLEDO HG63 Halogen Moisture Analyzer method is chosen. Drying in the oven is used as reference. If the results of the Moisture Analyzer match the reference drying oven method, it is verified that the Moisture Analyzer is working correctly. Additionally, periodical instrument calibration assures valid results. Controlling the instrument performance is time-consuming and, for this reason, is performed at prolonged intervals. Long gaps between calibrations lead to a blind spot in instrument performance monitoring.

SmartCal eliminates blind spot

SmartCal, an innovative and temperature sensitive reference substance, verifies the performance of moisture analyzers in 10 minutes. During a normal measurement cycle, the reference substance releases a defined amount of moisture. If this moisture amount remains within the control limits, the moisture analyzer is confirmed to be functioning properly. Test frequency with SmartCal has been defined specifically for the process and quality requirements of National Starch with the help of METTLER TOLEDO’s customer service. For National Starch, monitoring the status of their moisture analysis equipment has never been so quick and easy.

Text: Helen Vogt, Product Manager Moisture Analyzer

www.mt.com/smartcal
Complete Juice Analysis
With One Click® Multiparameter

The taste and shelf life of fruit juices and fruit juice concentrates are affected by sugar content, acidity and pH and require constant and accurate monitoring. With a rapidly expanding market, quality assurance faces many challenges, including keeping up with production, testing and the training of new operators. METTLER TOLEDO offers a reliable solution with multiparameter analysis.

The world is increasingly looking to fruit and vegetable juices for a source of daily nutrition. Projected world juice consumption is estimated at nearly 65 billion liters in the year 2015. Such a high demand calls for faster and more efficient production and testing. As with any growing market, quality assurance in juice production will face multiple challenges with a constant need to increase production efficiency and train new employees. Operators typically need to be trained and efficient in operating multiple instruments in order to determine the key factors for taste and shelf life, i.e. pH, acidity and Brix (sugar content) including the proper protocols for reporting test results. METTLER TOLEDO’s new multiparameter analysis system for juice and juice concentrates minimizes operator work and training, assuring measurement reliability and reproducibility with transparent result reporting.

One Click for all results
Using a multiparameter juice analysis system is simple. The operator simply places the sample on the system, clicks one button to begin the analysis and is then free to leave the instrument in order to perform other tasks safe in the knowledge that the system will accurately and efficiently not only analyze pH, total acidity by titration and Brix by refractive index, but also clean all components ensuring the system is ready for the next sample and avoiding any crossover contamination. Entering the sample ID for
result correlation is simple with the touch pad display and made even easier with an integrated barcode reader.

The system can be coupled with one of our many automated sampling systems allowing up to 80 samples to be prepared and tested simultaneously if a higher throughput is necessary to meet production testing needs. Adequate stirring is performed during pH measurement before moving the sample to the refractometer and titration vessel to avoid problems caused by the juice or concentrate settling when using an auto-sampler. A degassing device can also be used to automatically remove CO₂ from carbonated beverages guaranteeing accurate pH and acidity.

**Absolute data quality**  
Ensuring data quality with minimal effort is easy with our integrated LabX® software. Capture all results and calibrations in one convenient to read database. The LabX software can be fully networked allowing access to multiple users and automated result export to a LIMS or an ERP system. Correlating the results allows for automatic acid-corrected Brix calculation.

Providing easy to use, accurate, reliable and traceable multiparameter systems, METTLER TOLEDO has made the task of quality assurance for pH, acidity and Brix in juices and juice concentrates simple for both operator and manager.

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**GTP® – Good Titration Practice™**

GTP® covers the entire lifecycle of your investment. Dependable titration starts long before daily routines in the laboratory: A requirements-based selection of the titration system as well as professional installation and training form the basis of dependable and risk-free titration.

METTLER TOLEDO’s many years of expertise and experience are available in comprehensive literature and trained sales consultants.

**GTP®**  
Good Titration Practice™

For further information, go to:

[www.mt.com/gtp](http://www.mt.com/gtp)

GTP is a registered trademark of METTLER TOLEDO in Switzerland, the European Community, USA, China and Japan.
Testing Moisture in Sugar
Easy and Error-free

Moisture content is critical to the quality of sugar. The standard reference method for determining moisture in sugar is loss on drying. However, this time-consuming process must be carried out with the utmost care in order to avoid the many potential sources of error. One Click™ Loss on Drying, powered by LabX software, simplifies the procedure by offering intelligent sample handling, eliminating transcription errors and performing all calculations automatically.

The International Commission for Uniform Methods of Sugar Analysis (ICUMSA) defines method GS 2/1/3/9-15 (2005) for determining moisture content in sugar by loss on drying. The traditional way for carrying out this method can involve several typical sources of error, including manual data entry, transcription of results, crucible identification and calculation errors. These difficulties are compounded when several sample series are being analysed simultaneously.

**LabX – user guidance**
LabX software supports users throughout the entire loss on drying process and addresses all the above critical error points. LabX is installed on a network PC or server and is connected to an Excellence XP or XS Balance. The in-built application, One Click™ Loss on Drying, can be customized to match individual process requirements and is started directly from the balance with the One Click™ shortcut on the touchscreen display. LabX provides step-by-step instructions on the display so users can be sure that their method is being followed precisely.

**LabX – automatic calculations and documentation**
The user enters the number of samples and LabX automatically prints the barcode labels used to uniquely identify each crucible throughout the process. When the barcodes are scanned, LabX automatically records the sample weight against the correct crucible ID. Even after pausing the application for drying and cooling, error-free crucible identification, via barcoding, makes back-weighing the samples easy. LabX automatically records all weights and calculates weight loss. The moisture content percentage is displayed on the balance where a green or red screen clearly indicates if the sample has passed or failed according to defined process tolerances. The intelligent task management functionalities of LabX also make it easy to run several sample series simultaneously. A customized report can be printed out at any time and can even be printed automatically as part of the process. Data is stored safely in the LabX database for future use, such as for auditing.

**LabX – assists compliance**
International guidelines state that the moisture content of white sugar should not exceed 0.06% (e.g. the EU sugar policy Commission Regulation (EC) No 1262/2001). LabX offers an easy, secure and error-free way of performing moisture analyses using the oven drying reference method and plays a key role in ensuring that companies comply with regulatory demands.

Text: Stefan Christian, Group Leader Product Management Excellence Balances

www.mt.com/1-click-weighing
A Sharper Look at Titration Indicators
With a DP5 Phototrode™

Color indicators in titration can lead to large variations from one operator to another due to varying interpretation of color shifts. METTLER TOLEDO’s DP5 Phototrode can level reproducibility issues as a standard eye.

More and more food and beverage products are fortified with calcium, magnesium or even zinc for added health benefits. Determining the content of these minerals can be accurately performed by complicated analytical techniques using atomic absorption or ion chromatography. Alternatively, a classic titration can be performed with EDTA titrant and Eriochrome Black T as a color indicator for visual endpoint detection. Subjectivity of the human eye in determining color changes yields poor reproducibility when performing color indicative titrations.

A digital look at color change
Performing the classic EDTA titration with a DP5 to detect color change removes analysis reproducibility issues. The DP5 sends a light beam into the sample solution and measures this light’s reflected transmittance. More or less light is transmitted depending on solution color. Since the color change alone is measured, only infrequent signal strength adjustment with water is needed, keeping the system easy to maintain and extremely robust.

Using the DP5 combines time tested color indicator titration advantages with the objectivity of spectroscopic analysis. Operator subjectivity can be completely avoided and mineral content accurately determined in today’s functional food products. METTLER TOLEDO One Click® titrators, combined with the DP5, autosamplers and LabX® titration software for data processing have modernized time tested color indicator titrations for modern food product analysis.

Text: Matthew Eby, Product Manager Titration

www.mt.com/titration-sensors
Olive Oil Quality Control
Ensured by Reliable Weighing

In the olive oil trading and processing business, incoming shipments and outgoing deliveries are routinely analyzed to ensure that the product is pure and of an acceptable standard. The quality control laboratory of a large Italian wholesaler uses several METTLER TOLEDO balances, including a NewClassic MS303S, for testing samples of raw and processed oils.

Several METTLER TOLEDO balances, including the NewClassic MS303S, are used for testing samples of raw and processed olive oils in the quality control laboratory of a large, family-run trading and processing company in the Italian province of Tuscany.

Extra-virgin olive oil from producers around the Mediterranean arrives in bulk quantities at the company’s facility in the hills outside Siena. It is stored in an automated tank farm, from where the filtered and blended product is shipped to customers — these are mostly oil refineries and industrial consumers.

The Importance of reliable analysis
Quality control is important at both ends of the company’s value chain. Incoming deliveries need checking for contaminants and, especially excessive water, which tends to make the oil go bad and shortens the life of the plant’s demoisturizing filters. Should a consignment of oil contain more than 0.3% water, compensation can be claimed from the producer for failure to deliver adequate purity. Any outgoing product has to comply with Italian and EU regulations, to ensure that customers get what they pay for.

Durable workhorse
Around 25 samples per day are taken from incoming oil deliveries and processed product, before being analyzed for acidity, peroxide, fatty acids and extraneous organic compounds depending on how the oil will be used. Those samples are taken to the company’s on-site laboratory, which is small but well equipped, including gas and liquid chromatographs with automated sample changers, a mass spectrometer and a spectrophotometer. Weighing duties are performed by several METTLER TOLEDO balances, among them the NewClassic MS303S. This precision model offers a winning combination of strong performance and increased productivity thanks to a fast settling time and consistently reliable results, helped along by proven MonoBloc weighing technology and FACT — fully automatic time- and temperature-controlled internal adjustment.

Ease of cleaning can mean a great deal in this application, as spilled olive oil is messy stuff. The MS303S has a streamlined, easily wiped, oil-resistant housing.
with IP54 in use protection to stop liquids from getting inside. The high contrast display (HCD) with large numbers and clear symbols is an asset in this lab, where results from all the instruments are still manually entered into a database manually. Greater automation is a future possibility; the company is considering an investment into a laboratory information management system (LIMS). RS232 and USB ports are standard equipment on the MS303S, so sending weighing results to the LIMS will be easy and straightforward when that time comes.

Text: Joanna Imschweiler, Marketing Manager, Classic Weighing

www.mt.com/newclassic

**Tips & Tricks**

**Fast and easy cleaning**

In weighing, just as in all other activities, time is money. Why not focus on more important tasks, minimizing the number of secondary operations, such as cleaning the balance or the draft shield.

Watch just how easy it is to dismantle the balance draft shield in just 30 seconds!

www.mt.com/easycleaning
Good Measuring Practices
For Balances, Titrators and Pipettes

Risk-based lifecycle approach
METTLER TOLEDO, with its comprehensive Good Measuring Practices program for titration, weighing and pipetting, provides you with a scientific approach to optimizing your testing efforts. Optimal performance of your laboratory instrumentation minimizes process risk and secures internal and external audits at all times.

Reduce risk and optimize cost in just five steps
The five-step guidelines support you in ensuring compliance with the requirements of your quality system at any moment in the lifecycle of your instruments, and may significantly reduce the total cost of ownership of your laboratory equipment. The guidelines begin by evaluating your process needs, the associated risks and the regulatory norms of your industry. Based on this information, the guidelines generate tangible recommendations for selecting, installing, qualifying and operating your instruments.

Step 1: Evaluation
Thorough analysis
- Evaluate and document the device requirements for current and future applications.
- Identify the limiting factors of your process specifications.

Step 2: Selection
Perfect choice
- Choose the instrument that best fits your process needs to ensure highest accuracy and minimize process risk.
- Select the best option for your after-sales support agreement.

Step 3: Installation & Training
Fast, easy start-up
- Ensure perfect installation and commissioning of instruments.
- Profit from comprehensive user trainings and documentation.
- Achieve immediate operational readiness.
Step 4: Calibration & Qualification

Compliant to regulations
- Ensure consistent and timely calibration and certification.
- Qualify your devices according to IQ / OQ / PQ guidelines.
- Obtain encompassing, traceable, documentation for quality audits.

Step 5: Routine Operation

Optimized operational efforts
- Define testing and maintenance schemes for your specific process risk.
- Benefit from our extensive application database and application support for your daily work.

For more information: [www.mt.com/GP](http://www.mt.com/GP)

Good Measuring Practices Guidelines

METTLER TOLEDO’s risk-based guidelines for titration, weighing and pipetting empower you to take the right decision when and where it really matters.

Enjoy every confidence in your process safety and instrument performance day in, day out, knowing that you fully comply with the regulatory norms of your industry.

Good Measuring Practices guidelines satisfy all your needs for quality control and assurance, thus providing you with peace of mind at all times.
Dropping Point Determination
Simple, Compliant and Video-Recorded

Dropping point determinations at subambient temperatures starting from -20 °C can be carried out using a DP90 Dropping Point System. It consists of a control unit and a separate measuring cell, which can be placed into a refrigerator or deep freezer. The minimum temperature is safely reached thanks to the excellent furnace insulation and the use of an LED light source.

Raw ingredients and intermediate products in edible oil and fat refineries can be safely characterized.

One Click™ results
Dropping point determination has never been easier! Just one click is needed to start the measurement - the instrument does the rest automatically. Attend to other important tasks while the measurement is being performed.

Conform to standards
Operation according to the American Society for Testing and Materials (ASTM International) standard, amongst others, makes it easier to compare measurement results. Use all the cups specified in these standards with the innovative sample carrier.

Maximum insight
Visual camera observation and digital image analysis guarantee that determinations are reliable. The high-resolution color videos recorded during the measurement can be repeatedly played back on the instrument. This allows the control of unexpected results by visually reviewing measurements.
Increased Productivity
For Quality Food Production

When moisture content determines productivity, the HS153 is the instrument of choice. With a capacity of 150 g and 1 mg resolution, the HS153 provides accurate results required for producing high quality food products. The hanging weighing pan enables 360° free access, flat surfaces for easy cleaning and outstanding robustness for a long service life. Real-time drying curves and control charts display performance and boost productivity in the lab and the factory.

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<th>Productive</th>
<th>Robust</th>
<th>Easy-to-Use</th>
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<td>The drying curve is visualized in real-time on the display. The integrated control charts show how the moisture content of the samples trend over time for optimal process control and increased productivity.</td>
<td>360° free access to the weighing chamber facilitates sample handling. The flat surfaces are easy-to-clean. The weighing sensor is completely sealed. Spilled samples can not obstruct the balance.</td>
<td>To start frequently used methods, all you need to do is press a shortcut button. The small footprint of the HS153 requires minimal bench space. When using the optional stand, the instrument is narrower than an A4 size sheet of paper.</td>
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METTLER TOLEDO offers a variety of publications to keep you and your business up to date and well informed. Our offering includes technical journals, such as UserCom, live webinars giving expert advice and attractive videos via our laboratory YouTube channel. Register now and profit from these tools today.

Application Database
We offer comprehensive application support for weighing, moisture analysis, titration and many other analytical methods. Our titration application database alone holds over 300 applications for all relevant industry segments.

e.g. Titration applications  
  www.mt.com/titration_applications

e.g. Thermal Analysis applications  
  www.mt.com/ta-applications

e.g. Moisture Applications  
  www.mt.com/moisture-methods

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Our web-based seminars (webinars), live and on demand, give you the opportunity to receive specific and relevant information concerning our products and applications. You can also benefit from our reports on the newest and most advanced methods and standards available.

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