

# Testing Labs

Analytical solutions in the laboratory



# 9 News

## Surviving Harsh Conditions while Providing Accurate Results

**Despite its importance in our daily lives, few of us stop and appreciate that miraculous current that powers our lights, computers and televisions. We do not think twice about electricity, that is, until we do not have it. For NEETRAC, keeping the lights on is their ultimate goal and, to achieve that, a moisture analyzer from METTLER TOLEDO plays an important role.**

### The importance of PILC cable

Fortunately, for the National Electric Energy Testing Research and Applications Center (NEETRAC), a centre of the Georgia Institute of Technology, is working diligently to ensure that consumers are left in the dark less often. Located outside of Atlanta, Georgia, NEETRAC is a non-profit electric energy research organization that is supported by the electric power industry. NEETRAC is a consortium of 35 utilities and manufacturers and covers most major utilities in the United States. Formed in 1996 and recognized worldwide as one of the leading electric energy research centers, NEETRAC engages in a wide range of innovative research activities. One of their latest solutions deals with moisture problems in PILC (paper-insulated, lead covered cable), which carries

the electrical current that powers many of America's major cities. When PILC cable fails, the power goes out.

"PILC cables have been in use since the early 1900s," NEETRAC's Dr. Joshua Perkel says. "PILC cables contain oil-impregnated tapes that work very well as electrical insulation until moisture enters and then the cables tend to overheat and fail."

Every time there is a failure in a PILC cable, electric companies send field crews to test the cable for moisture. Currently, 'hot oil' is used to determine moisture amounts in the PILC cable. Crews call it the 'French Fry' test, which is completed outdoors on the back of a repair truck. Imagine a bucket containing mineral oil



**METTLER TOLEDO**



Utility crews can use the HB43-S quickly and easily from the back of their repair trucks since it is durable enough to survive harsh weather and travel conditions.



A protective box is designed to protect the HB43-S during travel and placed on the back of NEETRAC's utility trucks.

heated to 150 °F. A crew member places the cable's paper tapes in the bucket and waits. If the paper tape foams, then there is moisture in the cable.

"The problem is that paper often contains moisture meaning that a very small amount of moisture will foam, but that amount is probably not enough to cause a problem with the cable," Perkel says.

### An Advanced Solution for a Simple Test

The 'hot oil' test is a rudimentary test but the results are used to decide whether an electric utility spends a lot of money to replace sections of its cable system. NEETRAC, a longtime METTLER TOLEDO customer, needed a machine that would

analyze paper tapes for moisture content and be durable enough to be used outdoors. Their METTLER TOLEDO representative recommended the HB43-S Halogen Moisture Analyzer, due to its advanced halogen-heating device and sophisticated analytical technology. NEETRAC designed a protective box to shield the machine during travel and placed this box on the back of utility trucks.

NEETRAC is currently engaging in testing trials to see if HB43-S can be rolled out to electric utility trucks throughout the country. So far, NEETRAC has learned that the HB43-S can quickly determine the moisture content and offer an exact percentage in a fraction of the time normally required to heat and cool a bucket

of oil. Utility crews can also use the HB43-S quickly and easily from the back of their repair trucks since it is durable enough to survive harsh weather and travel conditions. "Currently, these units are being tested by utilities to see if they prefer the HB43-S approach to hot oil," Perkel says.

NEETRAC will not know the results of the field tests for a few more months, but the results look promising. According to Perkel, it is NEETRAC's job to bring alternative solutions to common (utility) problems. Working in tandem with a responsive and knowledgeable staff has helped to facilitate the research unit's work.

► [www.mt.com/moisture](http://www.mt.com/moisture)

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# High-grade Pipette Tips

## For Molecular Biological Testing

The prevention of external pollution in molecular biological tests is of extreme importance for the testing laboratory. As the consumables with the highest use frequency in molecular biological tests, the pipette tip should be taken into full account for the prevention of external pollution during testing processes. Rainin's BioClean tips with features of flawless form and special designs can meet the testing requirement in different fields at the testing laboratory.



### High frequency tip usage leads to high pollution risk

Nucleic acid detection technologies, such as PCR and isothermal amplification, feature rapid detection and high sensitivity. They are widely applied in fields such as pharmaceuticals, medical diagnosis, forensic identification and pathogens monitoring, etc. The molecular biological test features high sensitivity and the slightest change in the reaction system can affect analysis results whilst false positive medical diagnosis results may even give rise to legal disputes.

During the molecular biological test, from nucleic acid extraction, reagent preparation and amplification to detection, the pipette tips are frequently in direct contact with samples and reagents. The test for one sample usually needs approximately 10 tips and these tips should be frequently replaced with new ones during the testing process period as any tip containing materials that influence or prohibit nucleic acid amplification may lead to inaccurate experimental results.

Some testing laboratories have recognized this problem and have shifted from using common tips to highly clean tips.

### 100% cleanness guarantee

The pipette tips are the consumables with the highest frequency of use in molecular biological tests and the cleanness of tips is becoming ever more crucial to Lab inspectors. METTLER TOLEDO BioClean tips offer the highest degree of cleanness, ensuring that raw materials are selectively chosen, cleanly produced and securely packaged. The raw material of polypropylene contains no additives. Both tip production and packaging are automatically completed avoiding external pollution. The internal quality control and external supervision are undertaken in order to effectively prevent contamination. A perfect production process and precise quality control process ensure the 100% pure and clean quality of all BioClean tips and effectively avoids any contamination caused by tips during tests.

► [www.mt.com/bioclean](http://www.mt.com/bioclean)

## Secure Loss on Drying Meet Accreditation Requirements Easily

**The new One Click™ Loss on Drying application offers a higher level of process security for testing laboratories to easily meet the quality standards required for accreditation. ISO/IEC 17025:2005 specifies the general competence requirements for testing laboratories to carry out tests and/or calibrations and applies to all standard test methods. Included in the requirements is the standard reference method for determining loss on drying using the drying oven.**

### The traditional reference method

USP 731 precisely describes the method for the analysis of volatile content: Sample containers must be pre-conditioned in the drying oven. Each container must be accurately weighed before and after the addition of the sample in order to precisely determine the sample weight. Samples are then dried in the oven according to the monograph of each particular substance, e.g. Aspartame, commonly used as a sweetening agent food, beverages and pharmaceutical preparations, must be dried at 105 °C in 4 hours. Following cool-

ing in a desiccator the samples are re-weighed. USP 731 states that determination of loss on drying by thermogravimetric analyses requires the use of a sensitive electro-balance.

Great care must be taken to log all container IDs, sample IDs, tare weights and sample weights. The method is very time-consuming and there is a high possibility of recording the wrong result or calculating the moisture content incorrectly. Research indicates typical transcription errors may be between 4% and 10%.

### Three points for optimization

The new One Click™ Weighing Solutions are complete product packages for dedicated applications consisting of LabX software and an appropriate balance equipped with the corresponding accessories. One Click™ Loss on Drying is a comprehensive solution for analyzing moisture content and addresses three critical control points:

#### Transcription error – eliminated

No manual transcription is required. The lab technician enters the number of sam-



One Click™ Start



Samples with barcodes drying in the oven



Customized reports





One Click™ Loss on Drying

ples and barcode labels are automatically printed for the tare containers. After pre-conditioning, a barcode reader uniquely identifies each container and all weight results are automatically recorded.

## Sample handling – easy

Handling the samples is easy. Due to the unique identification, weighing the samples both before and after drying is greatly simplified. The order in which each sample is weighed is of no importance as One Click™ Loss on Drying ensures all weights are correctly logged against the corresponding container ID.

## Calculations – automatic

All calculations are performed automatically. One Click™ Loss on Drying determines the moisture percentage for each sample. The results can be printed out at any time in a customized report to meet documentation requirements.

The whole process is easy and error-free with high potential to make great savings in time and money. Easily integrated with LIMS or other internal systems,

One Click™ Loss on Drying really does offer a comprehensive solution.

## New innovative weighing solutions

One Click™ Loss on Drying is just one of a series of dedicated weighing solutions. New solutions can be created in LabX to exactly match individual weighing processes. With results stored securely and automatic calculations and documentation, day-to-day testing processes are easier, faster and more secure.

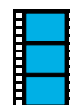
► [www.mt.com/1-click-weighing](http://www.mt.com/1-click-weighing)

## One Click™ Loss on Drying – See how easy it is

Benefit from this new solution for determining moisture content using the drying oven:

- Full SOP user guidance
- Intelligent sample handling
- Automatic documentation and calculations

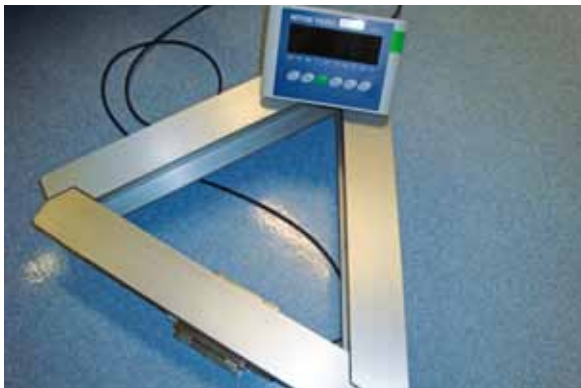
Watch the One Click™ Loss on Drying video on our landing page demonstrating how straightforward the whole process is.



► [www.mt.com/1-click-weighing](http://www.mt.com/1-click-weighing)

## Making the World a Safer Place by Controlling Nuclear Activities

The International Atomic Energy Agency (IAEA) is the world's foremost forum for scientific and technical cooperation in the peaceful use of nuclear technology. Among other testing equipment, custom-made scales are used to verify the amount of nuclear material declared by non-nuclear weapon states.



The scale used by the Department of Safeguards for weighing of barrels containing nuclear material.



A sturdy case protects weights during world wide shipping.

### Monitoring the contribution of nuclear technology

For more than three decades, the IAEA safeguard system has applied technical measures to assure the international community that the non-nuclear weapon states are honoring their commitment not to proliferate nuclear weapons. To enforce these commitments, the IAEA must be able to verify the declaration it

receives from each state concerning their nuclear activities and the nuclear material included in the safeguards agreement. IAEA inspectors carry out measurements to verify the amounts of nuclear material declared in the states account.

### Weighing of nuclear material

The Department of Safeguards at the IAEA headquarters in Vienna carries out

the quantitative and qualitative counting of nuclear material. For this purpose, customized scales and weights are shipped to nuclear facilities all around the world.

### The perfect solution

The department was looking for a flexible solution that could safely be shipped around the world. Manuel Hartmann, a



Radioactive material must be accounted for using scales and other testing equipment.

young sales representative in Vienna, was thinking outside the box and working with a local supplier on shock-proofed box inlays.

### Turning ideas into solutions

Manuel says, “We had to meet tough specifications. The IAEA was asking for a 550 kg scale to weigh barrels. The scale should be as small, light and robust as possible. Another demand was that the average user could assemble the scale without instructions in as little as five minutes. Mobility should be guaranteed through battery power. First tests of the prototype did not demonstrate the required stability and improvements were made. Our final solution was a triangular scale made of anodized aluminum profiles. An industrial load cell 0745A, combined with a weighing terminal 221, reliably delivers weighing results. The scale was tested using weights with nominal values from 200 g to 20 kg. The IAEA

also required a sturdy case that would hold the special set up weights from those packed singularly to entire weight sets. The custom made solution has lived up to expectations and more sets will be needed to keep up with world wide testing demands.

### System testing and optimization

The Department of Safeguard has decided to have the weighing system periodically tested by a METTLER TOLEDO service technician. To ensure accurate weighing results between these tests, internal processes for routine testing are standardized. Such procedures are already in place for other testing equipment and the overall results are highly positive. To bring scale testing up to this same high level, suggestions following the Good Weighing Practice™ guidelines will be offered. GWP® is an easy to follow guideline for handling weighing instruments in a quality management

system. With GWP®, measurement errors are minimized and compliance can be achieved with little effort.

Ensure peaceful use of nuclear material  
IAEA is relying on customized scales and test weights to verify the declared use of nuclear technology. In this sense, atomic energy can contribute to peace, health and prosperity throughout the world.

To learn more about weights, go to:

► [www.mt.com/weights](http://www.mt.com/weights)

To learn more about GWP®, go to:

► [www.mt.com/gwp](http://www.mt.com/gwp)

## Benefit From our Knowledge for Your Best Practices

**Discover 4 selected best practices from METTLER TOLEDO in [mt.com](http://mt.com). Profit from the useful, valuable yet free know-how from our experts to support your daily laboratory procedures and minimize risk of measurement.**

### Good Titration Practice™

Discover the 5 major steps to Good Titration Practice™. Comprehensive support and guidelines ensure the financial and time investment are always allocated appropriately whilst minimizing risks.



#### Risk Checker

Diverse factors can affect titration results. Spend 5 minutes answering 8 questions, determine titration result reliability and save money.

#### Movie

See how One Click Titration™ simplifies daily lab work with its uniform and intuitive user concept.

#### Brochure

Order a copy of the 'Good Titration Practice™' brochure. The brochure focuses on how to perform optimum titration analysis.

### Good Weighing Practice™

GWP® (Good Weighing Practice™) is a risk-based approach that clearly interprets the regulations of each industry and puts them into straightforward weighing practice. This results in a simple program that assures compliance at any time.



#### Risk Checker

Find out if your results are continuously accurate. Simply answer 8 questions and the GWP® Risk Check provides expert advice on how to optimize system quality.

#### Movie

Watch our educational videos and learn more about how GWP® ensures weighing result accuracy.

#### Webinars

Attend our 'Measurement Uncertainty & Minimum Weight' and 'Routine Testing of Weighing System' interactive GWP webinars to learn more on how to establish and maintain a sustainable quality of weighing processes.





## Good Crystallization Practice

Scale-up of crystallization is notoriously complicated and companies are under pressure to develop scalable crystallization processes faster, at lower costs and with higher quality. Companies must control crystallization conditions in order to improve cycle times and optimize product quality.



### Improving Laboratory Crystallization

Focusing on laboratory case studies, key stages in the process development lifecycle where the implementation of FBRM® and PVM® has been successful are demonstrated.

### Improving Production Crystallization

Discover five high impact ways to achieve ideal crystallization production conditions. Special attention is paid to the most common 'problem areas' encountered in production crystallizations where the implementation of FBRM® has proven useful.

### Crystallization Webinars

A variety of on demand crystallization webinars are available on our internet portal. The webinars support you in development, optimization and scale-up of your crystallization processes.

► [www.mt.com/crystallization](http://www.mt.com/crystallization)

## Good Moisture Practice

Moisture determinations need to be carried out reliably and quickly so that any interventions in the production process can be made promptly in order to avoid interruptions. Our website offers a valuable Moisture Guide method database and industry solutions which can help to save precious development time.



### Method Database

Explore the database that contains more than 100 methods referenced to an official moisture determination method (e.g. drying oven).

### Industry Solutions

Experience complete solutions for moisture analysis in a variety of industries, including sugar, plastics and wastewater.

### Moisture Measuring Principles

Learn more about the method of drying (heating the sample using thermal radiation) and the principle of the switch-off criterion.

► [www.moisture-guide.com](http://www.moisture-guide.com)

## Speed up Weight Calibration With ComparatorPac

**Calibrated weights ensure accurate weighing results and traceability to the International Prototype Kilogram. Weight calibration is, however, a precise and intensive process.**

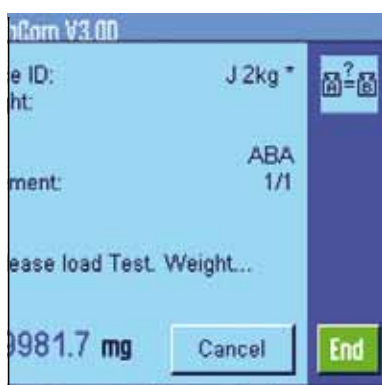


ComparatorPac™ makes weight calibration as simple and efficient as possible. Thanks to state-of-the-art comparator balances and a simple, yet effective software, several manual handling steps are

now automatically carried out reducing calibration efforts up to 40%. Such shortened calibration lead-times dramatically increases the lab capacity to carry out additional tasks. Comparator-

The package consists of:

- 3 comparators for calibrating weights from 1 mg up to 20 kg.
- OIML F1 calibrated reference weights up to 20 kg.
- MCLink Software to process calibration data and print reports.



### One Touch Calibration

A simple One Touch starts the calibration process. Simply follow the on-screen instructions and only handle the weights. No more operator or transcription errors as all results are stored and can be sent to any computer.



### Durable Weights

Premium steel, with a high gloss corrosion resistant surface for reliable and durable stability.



### Calibration Reports

MCLink automatically creates calibration reports at a keystroke. All parameters, processes used, references and results, with or without calculations, can be easily printed out in a certificate ready to be signed.

► [www.mt.com/ComparatorPac](http://www.mt.com/ComparatorPac)

# Pipet-Lite™ XLS

## The Best in Class Just Got Better

Rainin's new Pipet-Lite XLS family of pipettes brings precision, ergonomics and asset management to an entirely new level. With their sure-fit handles, lighter springs and Rainin's patented Magnetic Assist technology, these high-performance instruments are designed for ultimate comfort and ergonomic safety. They are also the world's first pipette family to be equipped with RFID tags for advanced calibration and asset management.



**Single-Channel**

**Multichannel**  
8 and 12 channel

**Adjustable Spacer**  
6 and 8 channel



### Secure volumes

The improved snag-proof design allows rapid volume adjustment even when wearing gloves, preventing accidental volume drift and delivering consistent results.



### Channel consistency

Rainin's patented LTS LiteTouch System assures a leak free seal on every channel, and with minimal force. With no nozzle o-rings, Pipet-Lite XLS's design eliminates a weak point and potential source of contamination.



### Ultimate flexibility

With our Adjustable Spacer model, all it takes is a simple twist of a dial to quickly move samples between different plate and tube formats.

# Spotlight on Promotion

## Find the Ideal Pipette and Win an Apple iPod™

Our new pipette finder helps you to find the most efficient and convenient pipetting solution for your application. Try it, request a quote\* and enter a competition to win an ipod nano.



\*No purchase necessary for participation in the drawing

► [www.mt.com/lab-pipettefinder](http://www.mt.com/lab-pipettefinder)