

# Testing Laboratories



**Intelligent Solutions**  
For Testing & Quality Control

**METTLER TOLEDO**

# Intelligent Solutions for High Efficiency and Reliable Results

**Today, laboratory instruments from METTLER TOLEDO form the foundation of laboratories all over the world, increasing the efficiency and assuring the quality of results. The success of our lab solutions is the result of intense research and development that seeks to achieve high-level efficiency, usability, and time-saving features – all with lasting performance in mind.**

## **Weighing**

METTLER TOLEDO is constantly changing the world of balances. Quantos sample preparation solutions and innovations such as SmartSens, SmartGrid and Smart-Screen provide complete weighing security. Our comprehensive portfolio of lab balances offer maximum user protection, unparalleled measurement performance, full data security and seamless traceability.



## **Titration**

The new generation of titration solutions focuses on ease of use and flexibility: Its unique One Click™ user interface keeps training times to a minimum and speeds up workflows. The completely automatic recognition of connected sensors, burettes and other accessories saves time again, while also enhancing operational safety. The modular design ensures perfect adaption to any titration application.



## **Pipetting**

Rainin pipettes enhance lab performance and help reduce time-to-result by guaranteeing optimum accuracy and repeatability. Innovative ergonomic designs, including the patented LTS LiteTouch System, minimize fatigue and injuries, thus helping to reduce operator errors and inaccuracies. Rainin's calibration and maintenance services are built on METTLER TOLEDO's high-precision balances and expertise.



## **pH measurement**

From basic handhelds to flexible triple-channel meters, METTLER TOLEDO offers a full spectrum of premium quality pH and ion instruments. The top-of-the-line Seven Excellence meter, for example, provides great flexibility through its modular design: Depending on the module attached, various parameters such as pH, conductivity, ORD, dissolved oxygen etc. can be measured.





Automated analysis systems to master high workload

#### Moisture

The moisture analyzers of METTLER TOLEDO provide fast and precise results thanks to the modern halogen dryer technique and the state of the art weighing technology used. The instruments are robust and very much suitable for demanding measurements.

For the specific and very precise determination of the water content from the ppm to % range, METTLER TOLEDO also offers Karl Fischer titrators.

#### Thermal Analysis

METTLER TOLEDO is the technology leader in thermal analysis instrumentation. The innovative product range includes DSC, Flash DSC, TGA, TMA and DMA, as well as an unmatched, very powerful common software platform.

Recent innovations such as the TOPEM® modulation technique and the HSS8 DSC sensor guarantee better results at higher sensitivities.

#### Density & refractive index

The days of manual determinations with pycnometers and optical refractometers are a thing of the past. METTLER TOLEDO's digital instruments determine the refractive index and density simply, accurately, and, depending on the instrument, even simultaneously. Automation solutions help to reduce the measurement of large sample batches to one click of the barcode reader.

#### Software & Services

METTLER TOLEDO offers a full range of service options, including flexible service packages, validation services and instrument training. These options help to be compliant with GLP and GMP regulations. They also support the ISO 17025 accreditation. Furthermore, METTLER TOLEDO has developed a variety of software solutions to allow the comprehensive control and networking of instruments.



# Innovative Weighing Technology

## Utmost Accuracy and Efficiency

**METTLER TOLEDO analytical and micro balances are used in many laboratories around the globe to provide precise and accurate results for even very critical applications. But our weighing solutions do not just excel in measurement performance, they also speed up the weighing tasks with innovations like the ErgoClips. Furthermore, maintenance is made easy through the intelligent construction of the instruments.**

Weighing the smallest amounts with optimum accuracy



XPE205 Analytical Balance

METTLER TOLEDO (ultra)micro and analytical balances offer unparalleled performance. With a capacity of up to 52 g with 1  $\mu$ g readability, and/or up to 220 g with 10  $\mu$ g readability, combined with the highest level of accuracy, you can achieve significant cost savings – particularly when using valuable materials.

Common tasks in quality control, such as sample preparation for HPLC, GC, IC, AAS, ICP and the like or weighing of standards, are performed with maximum efficiency.

► [www.mt.com/xpe-analytical](http://www.mt.com/xpe-analytical)



Quantos: Automatic gravimetric dosing

## Smart ideas that make weighing more convenient



### **Weigh in any container**

The ErgoClip holders for volumetric and round-bottom flasks, glass and plastic test tubes as well as disposable weighing pans allow all types of tare containers to be placed simply and securely. One-step dispensing directly into the tare container greatly simplifies and accelerates the weighing process, while the Faraday shield design of the grid basket prevents any distortion of the weight value resulting from statically charged tare containers.



### **SmartGrid replaces the conventional pan**

The revolutionary grid weighing pan minimizes the effects of air turbulence in the weighing chamber – for extremely fast results.

### **Perfectly clean in minutes**

Because the SmartGrid weighing pan is fastened at the back, spill substances simply fall into the tray underneath and do not distort the weighing result. Both parts can be removed for easy cleaning.



### **Quantos: Gravimetric Sample Preparation**

Prepare powder, liquid, gel, and paste samples quickly, easily and error-free. Hazardous or active substances remain sealed and thus, operators are protected. Weigh your sample and Quantos will add the correct amount of solvent, by weight, to reach your target concentration - flawless accuracy in a fraction of the time.

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

# Titration Reduced to One Click™

## Simple Operation, Highly Automated

**In a modern lab, a whole range of different instruments is used. Users have the challenge of learning how to use them all efficiently. METTLER TOLEDO is committed to optimizing the ergonomics of its solutions: Fewer keystrokes, self-explanatory menus, and simplest possible handling, clever automation solutions and easy maintenance all underpin our product development. Our new generation of titrators demonstrates this perfectly.**

One Click™ Titration – Execute your titration tasks with one keystroke!



The unique One Click™ Titration provides intuitive and easy operation, maximizes efficiency in daily tasks and eliminates potential operator errors. User specific shortcuts can be set on the home screen of the instrument to execute a manual or automated task with just one keystroke. Sophisticated plug and play makes sensors, burettes, balances etc. immediately ready for use on connection.

### Power your titration bench

LabX software offers access from both the instrument and a computer. The software system and interface are integrated for smooth and efficient control of multiple instruments with central data storage, validation and compliance using a single uniform operator interface.

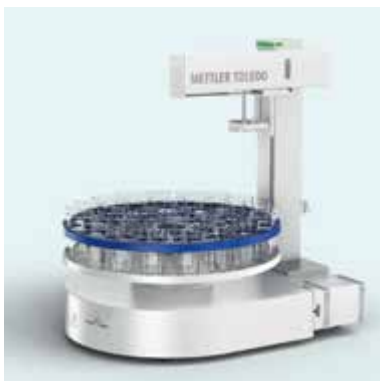
METTLER TOLEDO's software verification or validation services will help to ensure compliance with regulatory standards or that quality management standards are met.

► [www.mt.com/one-click-titration](http://www.mt.com/one-click-titration) ► [www.mt.com/LabX](http://www.mt.com/LabX)



Excellence Titrator with LabX software

## Highest level of automated flexibility: Sample changers and LabX software



### Flexible automation for your workflow

Designed for maximum throughput without sacrificing space, the InMotion Autosamplers are a fit for any laboratory.

Eliminate sample carry over with the rinsing unit PowerShower™, protect samples on the rack from contamination with the CoverUp™ lid handling.

LabX software opens the door of complete automation.



### Secure and efficient weighing with SmartSample™

Remove transcription and ordering errors as well as improve efficiency with the new SmartSample RFID technology workflow. Identify and weigh your titration samples at an Excellence Analytical Balance with the SmartSample kit. Enter the sample identification (ID) at the balance to make sure the ID and weight are properly assigned to the physical sample.



### Quality assurance through clever automation

LabX is flexible to the way you want to work. Operate and manage multiple benchtop instruments all from one common interface and software. Perform analyses and always have access to your current sample analysis and latest results. Ensure full traceability and support for the regulated and even paperless lab. LabX makes the automated lab free of transcription errors.

# Rainin Pipettes, Tips and Service

## Your Liquid Handling Solution

**METTLER TOLEDO's Rainin brand is highly regarded by leading scientists for its wide range of advanced and ergonomic liquid handling solutions. Scientists and their teams rely on accurate, high-quality pipettes and pure, contaminant-free tips to achieve reliable, reproducible results. Through innovative engineering and strict adherence to the industry's most stringent quality standards, Rainin delivers.**

Industry-leading accuracy and precision: Rainin's family of XLS pipettes



Manual and electronic pipettes in single channel, multichannel and adjustable spacing models

### **The LiteTouch™ System**

Protect your hands with LTS™. With their small, well-defined sealing area and positive stop, Rainin's LiteTouch System eliminates the need to pound or wedge tips onto the shaft. And because so little force is required to load the tips, they require less force to eject!

### **BioClean means beyond sterile**

Rainin BioClean tips are guaranteed to be free of additives and contaminants. The absence of bioactive components and external contaminants (DNA, DNase, RNase, ATP, Pyrogens, PCR inhibitors, trace materials or trace organics) ensures that they are completely inert and will not influence experimental outcomes. Invest in the quality and consistency of your results with Rainin BioClean tips.

### **Good Pipetting Practice**

Improve your data quality with Good Pipetting Practice™ (GPP™) - METTLER TOLEDO's comprehensive and systematic approach to maximizing pipetting accuracy and repeatability.

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





Pipet-Lite™ XLS Multichannel Pipette

From pipettes to tips to service, a comprehensive liquid handling solution.



**A new twist in pipetting**

Speed your workflow with Rainin's Adjustable Spacer multichannel pipettes. With these innovative pipettes you can quickly move samples between formats - from tubes to 96-well plates, for example - in just one step. Nozzles adjust from 9 to 19 mm.



**The 96 well multi-task master**

The Rainin Liquidator 96™ enables you to manually pipette into 96- and 384-well plates simultaneously on the bench top or in a laminar flow cabinet. Liquidator is fast, accurate and extremely precise. It's easy and offers complete speed control: faster for rapidly filling master mix into a PCR plate or slower for delicate or expensive samples. No electricity, programming or complicated robotics are required.



**The right tip for your application**

Rainin BioClean™ tips are manufactured and packaged in a state-of-the-art clean room facility. Full automation eliminates any possibility of human contact with the tips, resulting in pure tip products without any detectable traces of biological contamination. BioClean tips are available with a wide range of features, volume ranges and packaging options.

# From pH to DO and Beyond

## The Full Versatility of Seven Excellence™

**SevenExcellence measures pH, ion concentration, conductivity, oxidation reduction potential (ORP), dissolved oxygen (DO) and biological oxygen demand (BOD). It redefines flexibility and stands for convenient operation combined with measurement accuracy and outstanding reliability.**



S470 SevenExcellence™ with conductivity, pH and ORP indication

### Flexible and efficient at work

A variety of innovative solutions such as One Click™ operation on the large color display, touch screen, the ergonomic uPlace™ electrode arm, several interfaces, up to 3 measuring modules etc. provide flexibility on all levels supporting your workflow in the best possible way.

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



### Automation with sample changer

SevenExcellence supports the RonDolino sample changer for methods and series, making automated or unassisted analyses possible. This not only gives you the possibility to focus on other tasks but also allows for special applications such as automated pH calibration.



### A wealth of GLP support Leaves nothing to coincidence

The built-in GLP functions include PIN protection, GLP printout format, measurement acceptance limits, calibration methods and a radio controlled internal clock.



### InLab® OptiOx™

The OptiOx sensor for dissolved oxygen is based on the reliable RDO® technology. Rugged Dissolved Oxygen technology makes dissolved oxygen measurement easy. It provides stable results, fast response time and is immediately ready for use.

# Precision Moisture Analysis

## Accurate, Efficient, Versatile

When moisture matters, Excellence Moisture Analyzers deliver outstanding value. The new generation of instruments provides highly reliable results in the fastest possible time. Boost productivity with a powerful combination of real-time graphics and convenient data management. Print A4 color reports on network printers. Ruggedness and ease-of-use ensure disruption free operations.



HX204 Halogen Moisture Analyzer

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



### Fast heating

Advanced halogen heating technology is the key to fast heating and precise temperature control. The final result is released in record time.



### 360° Access, easy to clean

The fully sealed measurement chamber is robust and easy to clean. 360° access allows convenient sample handling.



### SmartCal Reference Substance

Keep your moisture analyzer under control at all times. SmartCal ensures accurate results and provides seamless QC documentation with a simple, 10 minute test.

# Striking Measuring Performance in Thermal Analysis

**METTLER TOLEDO thermal analysis instruments are used in labs all over the world to provide precise and accurate results and insights into material characteristics. The innovative product range includes DSC, TGA, TMA and DMA, an unmatched, very powerful common software platform and an outstanding worldwide customer support and service network.**

## **Material characterization by Differential Scanning Calorimetry**

The DSC 1 from the unique Thermal Analysis Excellence Line is the best choice for applications in quality assurance and production through to research and development. It utilizes an innovative patented DSC sensor.

## **Efficient Automation**

The sample robot for DSC or TGA can process up to 34 samples even if every sample requires a different method and a different crucible. Thus, automation increases the efficiency and extends the working period of the system dramatically.

## **Thermogravimetry**

Thermogravimetry is mainly used to characterize materials with regard to their composition. Using METTLER TOLEDO's world best micro and ultra-micro balances, results are accurate and reliable to the very last digit.

## **Thermomechanical Analysis**

Thermomechanical analysis, based on Swiss precision mechanics with nanometer resolution, measures the very smallest dimensional changes of the samples while undergoing a temperature program.

## **Dynamic Mechanical Analysis**

Dynamic mechanical analysis allows to detect thermal effects based on changes in the modulus or damping behavior.

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



DSC 1 with  
sample robot

# Efficient Density and Refractometry

## Highly Reliable with Minimal Effort

**High resolution instruments alone do not guarantee accurate measurements because the results can still be influenced by the operator or by sample-related effects. Automation is thus not only the best guarantee for a high sample throughput and fast payback, it also helps to prevent measurement errors.**



Density meter, refractometer, pH meter, sample changer and LabX software

### Automated workflow

LiquiPhysics allows simultaneous measurement of density, refractive index, pH/conductivity and color. The sample delivery and cleaning units completely automate the measurement of all parameters including thorough rinsing and drying.



### Heating options

In cases where samples are extremely viscous or even solid at ambient temperature, heated automation units allow reliable density determination.



### Traceable standards

Liquid standard reference materials facilitate reliable performance verification with one click.



### Convenient data processing

Barcode scanning for sample data transfer, method selection and automatic start. Bidirectional LIMS/ERP integration with LabX software.

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

# Global Services for Uptime, Performance, Compliance & Expertise

**Day-to-day laboratory and production processes are highly repetitive yet innovative, characterized by very complex applications and the need for guaranteed data quality and strict control of process risks. It is a world very sensitive to the total cost per data point, demanding the utmost precision and accuracy while constantly complying with legal and industrial regulations and norms.**

## Uptime



Easy access to support know-how and regular equipment checks according to standard procedures ensure maximum uptime at minimal cost. Your equipment is often subjected to tough environments and high utilization in critical processes, requiring every minute of uptime, guarding against equipment breakdown, parts failure, and 'wear and tear'.

## Performance



Professional installation and setup of your equipment along with the use of thoroughly tested applications guarantee high performance from day one. Regular preventive maintenance according to manufacturers' procedures ensures efficient and consistent performance throughout the life of your equipment, preventing out-of-spec results at all times.

## Compliance



Full compliance with your industry's regulatory norms is a must all over the world. This ensures good audit results and provides you with peace of mind. Take advantage of our comprehensive equipment qualification and calibration packages combining standard DQ/IQ/OQ documentation with recommendations for maintenance and routine testing specific to your application.



METTLER TOLEDO is represented with Sales & Service Organizations in 36 countries as well as Distribution & Service Partners in most other countries across the globe. In total, our products and services are available in over 100 countries.

## Expertise



Your expertise paired with the know-how of our Service Team are key to maximum uptime, optimum performance and 100% compliance.

Benefit from our large portfolio of optimized applications, scientific publications, SOPs and technical documentation. In our tailored trainings and seminars, your personnel acquire the know-how and skills to run your business.

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

## Global Presence

With our market organizations operating in most industrialized countries, as well as selected partners in other regions, we are ready to serve you well around the globe. Our geographically focused market organizations and partners are responsible for all aspects of sales, service and support. 5000 factory-trained service and sales specialists worldwide support you.

Products are developed and produced in various locations in the United States, Europe and China.

# Access Information and Know-how On [www.mt.com](http://www.mt.com)



## Testing Lab News

Get a regular update on customer case studies, product news and tips and hints. Register for your personal copy of the Testing Lab News

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

## Application Literature

We offer comprehensive application support for all of our solutions. Our thermal analysis application database alone holds over 600 applications for all kind of samples.

- [www.mt.com/ta-applications](http://www.mt.com/ta-applications)
- [www.mt.com/titration\\_applications](http://www.mt.com/titration_applications)
- [www.mt.com/moisture](http://www.mt.com/moisture)

## Webinars

METTLER TOLEDO offers a wide array of live and on-demand web-based seminars (webinars). Obtain specific information about best practice and latest news on applications, products, industry trends and standards.

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

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

For more information

**Mettler-Toledo AG**  
CH-8606 Greifensee, Switzerland  
Tel. +41 44 944 22 11  
Fax +41 44 944 30 60

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