METTLER TOLEDO competence in cosmetics laboratories

Understanding our customers’ needs and requirements and providing amazing solutions is part of METTLER TOLEDO’s corporate vision. For many years the cosmetics industry has relied on the competence and knowledge of our sales and support organization. Every day, thousands of laboratories and manufacturing sites use our pH meters, titrators, thermal analyzers, densitymeters, refractometers and balances.

Your competent partner

METTLER TOLEDO has a long and successful history of providing solutions and services to cosmetics companies.

To continue to be a competent partner in an increasingly regulated environment with escalating time and money pressures, we have launched a cosmetics segment initiative. The mission is to train our organization to fully understand our cosmetics industry customers’ applications and requirements.

METTLER TOLEDO has longstanding relationships with many global players in the industry, such as L’Oréal, Estée Lauder, Shiseido and Procter & Gamble. This has helped us to understand requirements specific to the cosmetics industry.

Wide product range

Do you need …

■ a precision balance to weigh in formulations?
■ a pH meter to determine the skin tolerance?
■ a Karl Fischer titrator to determine water content?
■ a refractometer to identify raw materials?

METTLER TOLEDO is the only supplier offering such a wide range of products: precision and analytical balances, pH meters, titrators, refracto- and densitymeters and instruments for melting point or thermal analysis.

Fulfil your needs

METTLER TOLEDO knows that each industry has its own very particular requirements. Our market segmentation initiative made us understand your industry even better. This competence allows us to specifically address your needs. We want to make sure that sales consultants will provide you with valuable product information and prompt after sales service tailored to your needs.

Our sales and service consultants are eager to demonstrate how METTLER TOLEDO fulfils the requirements of the cosmetics industry.
Lever Fabergé discovers the beauty of upgrading lab equipment

Greatly improved process control, faster laboratory throughput and improved test repeatability are just three of the benefits discovered by Lever Fabergé’s research facility after the upgrade of two key pieces of equipment.

The personal products manufacturer, which is part of the Unilever group, has installed a METTLER TOLEDO refractometer and a pH meter for use in the busy laboratory at its Leeds production plant.

The RE40 refractometer is used initially in the development of new products to the specification for perfumes going into deodorants. It is also used as part of the quality control process for leading brands with the refractive index being used to ensure that test samples comply with the specification. Laboratory manager Jayne Taylor-Hirst says, “We do a lot of work screening perfumes to ensure that they conform to our quality standards. Manufacturers often quote Refractive Index, a key quality parameter at either 20ºC or 25ºC, so it is important to us that we can change from one temperature to another quickly and easily, which the RE40 enables us to do.”

The MP230 pH meter is used in tests of Lever Fabergé’s range of shampoos, conditioners and skin creams, including the Organics and Ponds brands. In such products, it is critical that the correct pH levels are maintained to ensure that the product is neither too acid nor too alkali. Taylor-Hirst comments, “We carry out pH testing on raw materials and as a quality control measure on finished products to ensure a consistent pH is maintained. This helps to ensure product stability and is important as some raw materials, in particular preservatives, are most effective within a very specific pH range.

We also use pH testing for quality assurance to determine whether there has been any change in a product during its shelf life. It is also important that we can achieve repeatability of results, which can be difficult since some of the materials we test are low in ionic strength.”

The InLab®420 seen here with the MP230 pH meter is ideal for use with organic samples.
In both cases, the instruments have replaced older equipment, described as “very operator dependent”. Taylor-Hirst describes the benefits that have resulted from the new equipment, “Our previous equipment required much more input from the laboratory technicians, both in terms of carrying out the tests and in interpreting the results”. “The new instruments offer higher degrees of precision, consistency and reliability as well as being faster and much easier to operate.”

“For example, when we are looking at the pH of new formulations, with the MP230, we can ensure that the correct electrode is being used (in whatever matrix we are measuring) and plot the stability curve within two to three minutes. Also pH determination can be measured to three decimal places, whereas we could only previously measure it to two. In manpower terms, ours is a relatively small laboratory, but we do have a large turnover of samples.”

“The new equipment gives us more precise control over the processes we carry out and it has speeded up our work considerably, giving us the capability of handling more tests in a shorter timescale.”

**Built-in thermostat**

One of a range of digital refractometers, the RE40 can be used to measure refractive index and other related values, such as BRIX, HFCS and concentration. The equipment’s high-resolution optical sensor produces precise results quickly by measuring the total reflection of a light beam emitted by a special LED light source after hitting the sample. The total reflection is converted into a refractive index, BRIX, HFCS or user-defined concentrations. A key feature of the RE40 is its built-in Peltier thermostat, which controls the temperature without the need for a waterbath. Samples take just a few seconds to analyze, and measurement is always at the temperature determined by the operator, independent of the sample and ambient temperatures. Once the temperature is set, the rest of the process can be automated with a sampling unit and a sample changer.

**GLP compliant pH meter**

The pH meter chosen by Lever Faberge is the MP230, a GLP research pH/mV°C meter. Designed for the most demanding situations in research and development or quality control laboratories, the choice of electrode was also carefully considered. As the samples being tested are of an organic nature the electrode should have a large junction to create the optimum contact between reference electrolyte and the measuring solution. The choice of electrode is also crucial in these situations. With these factors in mind the InLab 420 electrode with Lithium Chloride electrolyte was chosen. This, combined with the MP230, provides accuracy, convenience and reliability. It offers GLP-compliant testing, automatic calibration, buffer prompting display, and temperature compensation. A function of the MP230 is automatic end point sensing (AEP), designed to automate a process normally carried out by an experienced operator. Sophisticated algorithms monitor the rate of change of signal from the electrode and freeze the displayed value when the reading is stable. The AEP function provides a wide range of temperature and pH conditions in a wide variety of sample types. As a result the speed and accuracy with which readings can be taken is greatly increased and, at the same time, risks of human error are reduced.
Weighing time is money

Whether weighing in raw materials into a formulation or analyzing product specifications - productivity is key for your company. This also applies to your work with the balance which must be fast and reliable. The Excellence Plus XP provides outstanding measurement performance and process safety for ultimate productivity.

The MonoBlocHighSpeed weighing cell reduces stabilization times, weighing results have a high repeatability, enabling your formulation results to be reliable and secure.

profHCT adjusts the balance automatically for extremely precise and repeatable results, thereby facilitating compliance with FDA or GLP regulations. The XP enables you to work faster and more accurately.

A clean solution

Hygiene is a must for cosmetics laboratories as products are designed for human use. Thanks to the straightforward design of the XP with large, flat surfaces and removable terminal, the XP precision balance is fast and easy to clean.

Robust and reliable

No matter where your balance is used, the rugged construction of the XP can be relied upon to perform. It has uncompro- mising protection against dust and water which, in use, is equivalent to IP54.

The overload protection of the MonoBlocHighSpeed ensures that excessively heavy loads do not damage the XP.

And much more …

SmartScreen, the colour display with touch screen operation greatly improves balance operation. Up to eight operators can save their individual settings, including colour profiles, and activate these effortlessly at the touch of a fingertip. Using your "own" balance guarantees that results are always reliable as it eliminates errors, thus reducing misunderstandings.

This and many more features make the XP a true innovation in the world of weighing. Contact METTLER TOLEDO for a full product brochure and further details.

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www.mt.com/xp
A new generation of weighing – XS analytical balance!

Weighing of precious raw materials, such as colorants, perfume oils, active ingredients and preservatives, are core R&D, Analytics and Quality Assurance activities within laboratories of cosmetics companies. The new XS analytical balance has a pace-setting new weighing technology: SmartGrid, the innovative grid weighing pan, has been specifically designed to make weighing more efficient and cleaning easier than ever. ErgoClips, the brilliant accessories for SmartGrid, allow safe and professional sample handling.

XS presents SmartGrid

With the new XS analytical balance, METTLER TOLEDO has brought a breath of fresh air to the world of weighing. The new grid weighing pan, with its unique fixing, offers practically no resistance to air turbulence in the weighing chamber. The result – reduced stabilization times and more accurate results.

Further advantages of SmartGrid include a weighing pan fixed on the rear of the weighing chamber creating a completely clear area underneath without awkward to clean cavities. If a product is spilled inside the weighing chamber, it simply falls through the grid and onto the tray underneath where it can be cleaned up easily.

The hanging weighing pan and draft shield of the XS, which can be completely dismantled, make cleaning the balance far easier.

ErgoClips are a novel type of accessory, which securely snap into the weighing pan and allow weighing into test tubes, round bottom flasks or weighing boats. They guarantee safe handling and weighing of all substances, be they powders, liquids or gels.

The XS range

Six different balance models are available with a readability of 0.1mg and 0.01mg from 80g to 220g.

RS-P42 printer

Handwritten entries in laboratory journal notebooks are a source of transcription errors and also time consuming. Records on METTLER TOLEDO standard and adhesive printer paper help to avoid such mistakes. The printouts can be archived and provide instant proof of the original weighing data.

The RS-P42 printer provides printouts of weighing results, regular adjustments and also individual settings and application results.

www.mt.com/xs
Mibelle Cosmetics – pH meters monitor skin friendly pH

The pH of human skin falls between 5.5 to 6.0. As many bacteria can survive only in a narrow pH range near neutral, this acidic pH helps protect the skin by discouraging the propagation of harmful bacteria from settling onto it. Since the development of soaps and cleaning solutions with non-irritant properties, pH has become a chemical value with high public visibility and awareness. METTLER TOLEDO SevenEasy assures the pH balance of products at “Mibelle” Cosmetics.

pH in the cosmetics industry

Together with refractive index, density and the concentration of active ingredients, pH is one of the most important parameters in the quality control of cosmetic production. pH provides revealing insights into the correct concentration of substances such as benzoic acid (preservative), tensides or gelling agents. Whereas the variety of ingredients used in cosmetic products is extremely broad, the pH range is rather narrow, usually varying between pH 4.5 to 7.0. In very rare cases this can fall to below 4.5 and, in the case of depilation creams, the grade acidity is around pH 11. This does not require high demands from instruments and electrodes. The most challenging area for pH measurement is the contamination of the electrode by viscous pastes that are hard to remove and may clog the sensor’s diaphragm.

Mibelle Cosmetics

Mibelle Cosmetics AG was founded in 1961 as a subsidiary company to the largest retail company in Switzerland. Following initial success with soaps, toothpaste and other bath product lines, Mibelle enlarged its product portfolio continuously. This now covers a wide range of cosmetic products for the care, protection and cleansing of skin, hair and teeth. Mibelle is currently expanding to Germany, UK and North American markets. This may impose new challenges due to the lack of internationally binding regulations.

MT pH meters at Mibelle

Mibelle recently bought several SevenEasy instruments for research and quality control purposes. How does SevenEasy match the needs of the cosmetic industry? Firstly, the 3-point-calibration fits your specific needs perfectly. Secondly, because of its compact size, large display and ease-of-use. For future regulatory requirements concerning data capturing, SevenEasy meters are equipped with an RS232 interface. Finally, the SevenMulti advanced pH meter allows automation of pH- and ion measurement with the sample changer Rondolino, an option which is particularly valuable for busy quality control laboratories. Cosmetics laboratories choose METTLER TOLEDO because of our experience in electrode manufacturing. Our portfolio includes several electrodes with appropriate features for measurements in high-viscosity cosmetic products:

- The InLab® 413/414/415/416/418/419 combination electrodes with PEEK shaft prevent diaphragm clogging due to their polymer electrolyte-based reference system and open junctions.
- The InLab® 432 is a robust pH combination electrode. Its triple diaphragm is responsible for the electrode’s highly reduced sensitivity to contamination.
- The SevenMulti advanced pH meter with the sample changer Rondolino covers an extensive range of pH applications in cosmetic laboratories.

The Seven pH meter, in combination with the variety of specific InLab electrodes, covers an extensive range of pH applications in cosmetic laboratories.
Perfect moisture levels – KF-titration of creams, lotions and lipsticks

Water determination in the cosmetics industry is important and most effectively carried out with the METTLER TOLEDO Karl Fischer titration system DL38. This modern titration system allows easy operation by production operatives and incorporates built-in methods for cosmetics samples such as creams and lotions. The DL 38 supports compliance requirements from FDA or other related bodies and facilitates LIMS or ERP integration.

Cosmetics products are often water-based emulsions. Water content is therefore critical, as too much water leads to bacterial growth or an unacceptable tactile experience for consumers. Too little water may affect the homogeneity of the cosmetic product and is undesirable from a cost perspective. Hence, water content determinations are commonplace in the cosmetics industry. Development laboratories examine new formulae or test long-term stability and quality control operations check raw material water content and each final product.

Karl Fischer with DL 38

Karl Fischer titration has been established as the method of choice for water determinations in the cosmetics industry because it is fast, accurate and selective for water and covers a wide measuring range.

The METTLER TOLEDO DL38 volumetric Karl Fischer titration system supports users in today’s demanding environment and addresses issues specific to the cosmetics industry, such as sample characteristics and preparation, the regulatory environment and modern data handling requirements of LIMS or ERP systems.

The DL38 facilitates operation through its unique user guidance. The instrument can be programmed to support the user by checking limits or suggesting calibration at the appropriate interval. The simple operation, through a graphic display, allows non-specialised staff operation thus making production line analysis possible by factory staff.

Simple sample preparation

Samples such as cream or lipstick are challenging to introduce to the sample vessel and may not release their water without powerful solvents. The DL38 system offers solutions to both these problems: the ViscoSpoon™ is the perfect accessory for viscous samples as it reduces ambient moisture contamination. A high-speed homogeniser, controlled by the titrator, eliminates the need for chloroform or other toxic solvents and reduces analysis time by a factor of two.

Regulations and systems integration

Cosmetics with pharmaceutical ingredients are subject to regulatory approval. Quality systems need to be in place and the instrument systems used for quality control must be qualified at regular intervals. Furthermore, electronic data is subject to 21CFR-11 part 11, which regulates handling, control and modification of electronic records. The DL38 system is used throughout the pharmaceutical industry and meets the requirements of the most stringent regulations. Thanks to LabX titration software, anxieties about compliance are now completely eliminated.

Many companies want to integrate their laboratory into their ERP (Enterprise Resource Planning) system. This can be laborious and costly. System integration of the DL38 system is facilitated by LabX titration software, the client/server approach to database and a special program called LabX CONNECT supporting easy LIMS integration.

Karl Fischer titration is commonly used in the cosmetics industry for water determinations. The METTLER TOLEDO DL38 is well suited for this task as it is simple to operate, allows handling of specific cosmetics samples, is compliant with relevant regulations such as FDA 21CFR-11 or GLP and allows easy integration into ERP and LIMS systems.

www.mt.com/titration
We share our knowledge

Learn from what we have learned. Our knowledge and experience are at your disposal—in print, on-line and also, increasingly, on CD-ROM. Each document can be used as a reference book, glossary, or guide to inform you of the latest methods for a wide variety of applications.

Methods for cosmetics industry

- Titration methods:
  - Water determination in body lotion with internal extraction
  - Iodine value of cosmetic fats according to Wijs
  - Acid number of cosmetic creams
  - Potentiometric surfactant determination in shampoo
- Thermal analysis methods:
  - Cloud point determination of oleic acid samples
  - Dropping point determination of lipstick
  - Quality control of vaseline
- Moisture Analyzer methods:
  - Moisture analysis of shampoo
  - Moisture analysis hair gel
  - Moisture analysis bubble bath

Product literature

1. Excellence XS analytical balance
2. Excellence Plus XP precision balance

Technical documents

3. Weighing the right way
4. Guide to pH measurement
5. Methods of moisture content determination
6. Karl Fischer methods at a glance

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