Passionate French Perfumes
Through Rigorous Quality Control

For nearly ten years, Guerlain has been manufacturing perfumes at its Orphin site in France. Raw materials are delivered to the site where mixing, filling and packaging operations are carried out. METTLER TOLEDO’s DR45 density and Refractometer has greatly helped increase productivity.

A long established and prestigious brand, such as Guerlain, has to carry out numerous controls throughout the production process to ensure the resulting products comply with the exacting quality standards that have formed its reputation. In order to achieve this, a 12-strong team is responsible for carrying out all of the controls necessary to ensure the quality of Guerlain products from raw materials through concentrates, bulks, filling and packaging components and finished goods.

Quality of raw materials is key
Julien Garry, the quality manager at the head of this team, recently acquired a DR45 combined refractometer/densitometer for controlling both the raw materials and concentrates used in the composition of the perfumes. The research and development department communicates the specifications for each product and then each delivery is analyzed to ensure that it fully complies with required standards.

Previously, two separate instruments were used (a refractometer and a densitometer) and the analyses were carried out one after the other which took up a lot of precious time. In addition, this posed further organizational constraints as the apparatuses were not always available or immediately clean. Two items of equipment also meant two different quality assurance and maintenance programs.
Considerable improvements with combined meters

Since acquiring the DR45 with an automatic sample changer, the process has been considerably improved. “The automatic sample changer means samples can be tested one after another whilst we get on with something else, which means we are better organized. We can even run the DR45 overnight so that it is available to use again the next day. What’s more, the same instrument can carry out two analyses simultaneously, which results in considerable time savings! In terms of maintenance, a specific method for cleaning the measurement cells has been developed in order to ensure periodic, preventive maintenance, which was not the case with the previous equipment.” points out Mr. Garry.

Last but not least are the new advantages offered by the data transfer to a computer system. Measurements are instantaneously integrated into a spreadsheet, which is most useful in terms of traceability and it allows past controls on raw materials to be pinpointed very quickly.

Relying on METTLER TOLEDO’s expertise

Mr. Garry explains, “now, when we have to discuss something with R&D, it is instantaneous – unlike before when we had to search in the file for the past history, recopy the data onto paper and then send it by e-mail, which took between 24 and 48 hours. Today, the data is filtered and sent by e-mail directly. Consequently, comments and exchanges can be made immediately – a real gain in reactivity at all levels!”

In order to ensure that his instruments remain in tip-top condition, Julien Garry has taken out a maintenance contract, which means they are maintained and qualified by a METTLER TOLEDO technician. “METTLER TOLEDO’s instruments are both reliable and tried and tested, but they still have to be regularly serviced and I prefer this to be done by someone who both understands and is completely familiar with the equipment. We use external contractors to carry out maintenance checks on other types of equipment, but for equipment like balances, densitometers, refractometers, dropping point and melting point instruments, we use METTLER TOLEDO for qualification. We know that their technician will come to service the instruments as quickly as possible and that the checks and controls will be carried out by a professional, which is in our interest.”

Julien Garry knows that he can count on METTLER TOLEDO’s expertise and experience to ensure that the permanent controls carried out throughout the whole production chain are reliable, thus helping to ensure the exceptional quality of Guerlain products.
Saving Precious Substances
With the XP56 Micro Balance

When manufacturing sun protection creams and lotions at Spirig Pharma, many analyses using freshly prepared standard solutions are performed in the quality control lab. To prepare these standard solutions, small amounts of expensive substances are needed. METTLER TOLEDO’s XP56 micro balance is the perfect tool for dosing small sample quantities directly into the final container.

Dosing small quantities directly into large containers
Spirig Pharma, Switzerland, is a leading manufacturer of dermatology products, mainly sun creams and lotions. In the quality control laboratory, final quality control of all product batches is carried out. For every quantitative analysis, standard solutions have to be prepared freshly due to the short stability of these reagents. Thanks to the large weighing capacity of the XP56 micro balance, it is possible to place a 20 ml volumetric flask on the balance and directly dose precious substances into it with clear advantages: the sample does not need to be transferred, the process is accelerated and spillage of expensive substances is avoided. Thanks to their world-leading resolution, XP micro balances are perfect for weighing small sample quantities as they allow lowest minimum sample weights according to USP (US Pharmacopoeia).

Enhanced productivity
Fast weighing processes are essential for Spirig Pharma and the XP56 is ideal to significantly optimize their applications. The inner draft shield, in perfect combination with the SmartGrid weighing pan, enables stable results in an instant. The daily adjustment of the balance is automated by proFACT (fully automatic internal adjustment) for secure results and valuable time of the laboratory staff is saved. Problems related to statically charged samples or containers can be avoided with the integrable Antistatic Kit. And all draftshields can be dismantled quickly for easy cleaning. Thanks to the XP56 micro balance, weighing productivity was improved and the waste of precious substances reduced, resulting in considerable time and cost savings for Spirig Pharma.
Formulation Color Under Control
With Thermogravimetric Analysis

Advances in technology and raw materials have enabled personal care producers to introduce an amazing array of new products in always shorter period of time. The rigorous control of raw materials, formulation development and finished products is key – and thermogravimetric analysis an indispensable tool.

An example is shown below to illustrate how thermogravimetric analysis (TGA) can be used as an important tool to control the formulation of color used in cosmetic products. The weight and tone of the coloring agents used during the manufacturing step is critical for the production of cosmetic products such as lipstick, nail varnish and face foundation. Small weight variations of color additives during production could cause drastic changes to the color and the perception of the end product by the consumer.

The color of success
The use of iron oxides is permitted in all cosmetics products. This pigment holds a very important place in the cosmetic market because of the wide range of colors that can be obtained, its low cost as well as its longer term stability and non-toxic nature.

The most common pigment used in the cosmetic industry is the synthetic red iron oxides. These are produced by several manufacturing processes. Each process produces a typical particle shape and is described below:

- Calcinations of ferrous sulfate
- Precipitation
- Calcinations of yellow iron oxide
- Calcinations of black iron oxide.

Depending on the thermal history or precipitation growth cycle, it is possible to produce a family of products with hues ranging from light to dark red. The TGA/SDTA851e is used to evaluate the different transformations of iron oxide over a wide temperature range. The plot below highlights the three major classifications: reds, yellows and blacks.

Using the information gained from the METTLER TOLEDO TGA, it is possible to quickly control each batch of iron oxide to guarantee the desired color of the cosmetic product. In addition, the TGA measurements can also be used to compliment other analytical data such as color testing, specific area and particle size measurements.

Source: LVMH Recherche, Parfums et Cosmétiques (France)
Hand-friendly Testing of Creams and Emulsions
For positive Displacement Pipetting

R&D and testing laboratories dealing with cosmetics typically have to check creams, perfumes and emulsions several times before the final cosmetic product adorns Ms or Mr Consumer. RAININ, a leader in manual liquid handling\(^1\), developed the world’s first truly ergonomic positive displacement pipette. The Pos-D™ is specially suited for liquids with high densities, viscosities or vapor pressures. New technology and product features help to speed up daily pipetting work in a truly hand-friendly manner.

**Challenges in liquid handling**
Conventional pipettes cope badly with high density or viscous solutions as the necessary pressure equalization within the pipette tip and the ambient environment does not completely occur. A viscous liquid, to take but one example, will not be aspirated and therefore sampling will not be accurate and precise. The pipette plunger can even get stuck amid the aspiration process and liquid handling comes to a stand still.

**Precisely dispensed testing of emulsions**
The testing of emulsions or creams onto skin is critical before the final market introduction of such products. Typically, a well defined and precise quantity of the sample is applied to act on a given area of the skin in order to study the reaction of the emulsion with the skin. High precision sampling is necessary in order to achieve meaningful reproducibility of these tests.

The Pos-D™ is especially suited for liquids with high densities, viscosities or vapor pressures. A disposable piston, moving within a plastic capillary makes direct contact with the liquid. The positive wiping action of the position against the capillary wall assures complete dispensing without droplets and protects samples from instrument contamination.

**Hand-friendly pipetting with visible volume setting**
Like all RAININ pipettes, the Pos-D™ impresses due to its ergonomic design. The larger, more ergonomically-designed handle of Pos-D™ feels natural and fits comfortably in the hand and the ergonomic finger hook means there is no need to grip. Pos-D™ rests comfortably in the hand and, to avoid any mistakes, volume setting stays visible during pipetting. No need to twist the pipette to set or read the volume.

\(^1\) RAININ, a METTLER TOLEDO company, is the leading pipetting solution in the USA and globally present with a dedicated sales- and service team.

[www.mt.com/rainin](http://www.mt.com/rainin)
A reliable Service Partner in each step of the process

METTLER TOLEDO’s ServiceXXL approach provides cost effective service solutions to ensure optimized equipment uptime, traceability of results, and regulatory compliance. These services include classic repair services, tailored service plans and on-site services that provide you with the maximum return on your investment. Our qualified specialists are committed to providing the highest level service to support you in the entire Equipment Life Cycle.

<table>
<thead>
<tr>
<th>Process Step</th>
<th>Solution</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Selection</td>
<td>• Active support in identifying the very specific requirements</td>
<td>• Assurance to select the right equipment</td>
</tr>
<tr>
<td></td>
<td>• Guidance to select the right equipment</td>
<td>• Rely on qualified supplier and service partner</td>
</tr>
<tr>
<td></td>
<td>• Trust to work with the right supplier</td>
<td>• Optimization of financial resources</td>
</tr>
<tr>
<td>Installation &amp; Qualification</td>
<td>• Comprehensive solution package to ensure professional qualification</td>
<td>• Limited start-up costs</td>
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<td>• Equipment Qualification-Pacs as a stand alone solution to cover the</td>
<td>• Achievement of Regulatory Compliance</td>
</tr>
<tr>
<td></td>
<td>entire qualification phase</td>
<td>• Qualified equipment for routine operation</td>
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<td></td>
<td>• Initial Qualification-Pacs to cover the installation and initial</td>
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<tr>
<td></td>
<td>calibration</td>
<td></td>
</tr>
<tr>
<td>Routine Operation</td>
<td>• Basic Preventive Maintenance and Calibration services</td>
<td>• Optimized uptime</td>
</tr>
<tr>
<td></td>
<td>• Customer Support</td>
<td>• Controlled costs</td>
</tr>
<tr>
<td></td>
<td>• User Seminars</td>
<td>• Accurate and traceable results</td>
</tr>
<tr>
<td></td>
<td>• Industry specific re-qualification services</td>
<td>• Maintained Regulatory Compliance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Productive and safe working processes</td>
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New Excellence precision balances!
Six new precision balances have been added to the Excellence Plus XP and Excellence XS ranges. Several models with 1g readability are now also available as verified versions. The XS 12001MDR, is perfect for the dosing of components up to 12kg and is therefore well suited to dose cosmetics components in blending processes.

New micro electrode is BIG on technology
With its Redox Couple Reference the InLab®450 does not only determine pH incredibly fast but also without any risk of contaminating the reference junction, thus always giving the correct readings. It is the ideal electrode for microbiological, biochemical and chemical laboratories in the cosmetics industry.

Welcome to the METTLER TOLEDO Sensor Product Guide
Human skin has a pH of approximately 5.5. The acidic level acts as a barrier against infection. Cosmetics products are applied to the skin and can have a potentially damaging pH-modifying effect. Careful pH-monitoring is therefore crucial in development and production. METTLER TOLEDO presents a new, web-based pH electrode selector guide, assisting cosmetics companies in selecting the most appropriate electrode. This improves accuracy and reproducibility of the measurement, thereby increasing product quality.

Automated density measurements for accurate results
The new METTLER TOLEDO PSU-DE Sampling Unit provides you with reliable results in density measurements. The compact automation unit allows the measuring cell to be thoroughly cleaned and dried, and ensures that possible measurement errors are automatically detected. As cosmetics substances can be very sticky, thorough cleaning is particularly important in between samples. PSU-DE assists with that and helps to standardize the cleaning process.
Strong solutions for improved productivity

METTLER TOLEDO’s goal is to constantly devise and improve laboratory solutions and fulfill customer needs on the highest level. We provide effective technologies and state-of-the-art applicative solutions. Our balances meet a diversity of needs and our analytical instruments assure reliable liquid or substance composition or property results.

The DL50 Rondolino automates sample changing in an affordable and very compact way. The unique automated titration stand Rondolino already pays out for single samples and small sample series.

Volumetric Karl Fischer titrators: Designed for a wide range of water content applications – suitable for many different cosmetic products, such as creams, lotions, shampoo or perfume.

Tight pH limits a must in modern cosmetics
The glass-free pH-electrode InPro3300 performs with very rapid response time and shows extremely high accuracy in alcohols.

Imagine controlling all your titrators and balances via a network; maintaining all your data securely but easily accessible on a central server; looking at the analysis results directly in your office … With LabX all this becomes a reality.

SevenMulti pH/conductivity meter: Professional performance with modular expansion possibilities at any time!

LabX software solutions

Analytical Instruments

www.mt.com/dl5x-rondo60

www.mt.com/karl-fischer

www.mtpro.com/pH

SevenMulti pH/conductivity meter: Professional performance with modular expansion possibilities at any time!

Volumetric Karl Fischer titrators: Designed for a wide range of water content applications – suitable for many different cosmetic products, such as creams, lotions, shampoo or perfume.

Weighing Solutions

XS analytical balance: High-speed weighing and a clean solution thanks to SmartGrid and ErgoClips for increased productivity and undisturbed routine operations.

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