

Givaudan, the international creator of fragrances and food flavours, has three sites in France - Paris, Argenteuil and Lyon. We met Mr Serge Lemaître, Quality Control Manager at Argenteuil, who uses a titrator to determine the saponification index of raw materials.



The sweet smell of success – titrator helps cut analysis time in the fine fragrance industry



Givaudan®



The perfumer's palette

The key activities of Givaudan – founded in 1780 under the name Roure – are the creation and development of perfumes and fine fragrances, the manufacture and sale of new molecules and synthetic products and the creation and development of food flavours. Usually referred to as the famous palette, the raw materials available to the perfume/fragrance industry are continually evolving. Around 1,000 raw materials are commonly used, but 2,000 are still produced and used for older fragrances on the market. Although functional fragrances i.e. those used in deodorants, shampoos, detergents, etc are also produced at the site, Argenteuil is dedicated to the production of fine fragrances - top of the range products where natural materials are never replaced by

synthetic materials, due to the very specific olfactory characteristics of natural products.

Concentrates are manufactured in the mixing room according to formulae established by perfumers and selected by clients. The site uses a lot of natural materials from many suppliers. The first step is to analyse these raw materials to check their quality. As Serge Lemaître explains, “We check quality and consistency. To do this we use three different types of control - analytical, chromatographic and olfactory. Although controlling the olfactory aspects is very important in terms of our clients brief, the analytical aspects are also vital. We have to check our raw materials in order to ensure we obtain concentrates with consistent colour, appearance and viscosity, as well as fragrance.”

Monitoring possible discrepancies between changes in the reference and changes in production

Givaudan also closely monitors its production. The Quality Control laboratory is directly linked with perfume creation because it ensures that large scale manufacture corresponds to the sample originally selected by the client. The initial control is carried out in comparison with this reference sample. Controls are then carried out on samples taken four times per day in order to check for the slightest discrepancy. "We need to know if any discrepancies are due to a production anomaly or inherent in the raw materials, which can vary (as a function of the crop, the source, the year, etc). Every ingredient is weighed out by an operator, who then records the data in a computer programme, which allows us to check every batch of raw material that has been used in each production." Since the bottleneck in the system is the olfactory control (around six hours are needed for a concentrate to evaporate to check the base notes) the Quality Control laboratory has to receive the samples as quickly as possible. The product leaves the company once it has been released by Quality Control within 24 hours, in order to comply with delivery times of five days.

The DL53 determines the saponification index

Serge Lemaître says, "For me, it was imperative that we changed our titrator because our old one did not have a traceability function, which is required by the ISO 9000 Standard. We also wanted a system with an automatic sample changer so that analyses could be carried out in a routine manner. While the series is being analysed in a repetitive manner by the titrator, the laboratory technician can get on with other work." The saponification index (the number of mg of potassium hydroxide consumed per gram of sample analysed) is a measurement of the free- and esterified- acid content of fats, oils

and fatty acids. Only certain raw materials are analysed in this way - synthetic products, liquids, pastes, resinous materials, absolutes and natural products.

Problem solving

The sample, dissolved in a suitable solvent, is heated to reflux temperature for a given time in the presence of potassium hydroxide. However, a potential problem in automating the titrator and automatic sample changer was the type of recipients used for heating the samples to reflux temperature - a standard 29/32 round bottomed necked flask. This meant that the sample had to be decanted into a titration beaker, resulting in inaccuracies, loss of time and greater consumption of materials and solvent. The solution proposed by METTLER TOLEDO was to replace the flasks used for manual analysis by COD tubes. The sample is now weighed directly in the tube before the introduction of the solvent and the potassium hydroxide and is heated and then cooled. Next the tube is placed in the automatic sample changer. The DL53 then only has to assay the fraction of potassium hydroxide not consumed and to calculate the saponification index. "The DL53 coupled with the Rondo 60 automatic sample changer have given us more flexibility and increased process speed. We can now release batches much more quickly", concludes Serge Lemaître.

