



## A process marked by constraints



■ **Guerlain, has two factories in France, one at Orphin in the Yvelines for the creation and production of perfumes, and another at Chartres for cosmetics. The Orphin site is dedicated to the production of perfumes, as well as soaps, deodorant sticks and, on a more occasional basis, scented candles.**

As with many other products, it all starts in the marketing department where the overall perfume package is conceived, i.e. the timbre of the scent, the shape of the bottle, the colors involved, the packaging, etc. Once the project has been given the go-ahead, the technical project manager carries out a manufacturing feasibility study on the product. This is designed to determine whether the formula and packaging can be realised and whether the factory can actually manufacture the product, etc. Once the manufacturing feasibility is confirmed, models are created so as to determine dimensions and volumes with a view to drawing up plans for each component. Following approval of the model, suppliers are consulted for all the components other than the perfume itself, i.e. bottles, labels, finishes, atomiser pumps, cartons, packaging items, etc. So that the suppliers can attain the required level of quality, Guerlain goes one step further in assisting them by regularly monitoring compliance with the plans in order to prevent errors and ensure the original requirements of the Marketing department are met.

Finally production can be started, but before full production, Guerlain receives a pilot batch, a small number of items representative of all the components. These will be tested by Guerlain directly

on its production lines and filled with the perfume produced on site, with a view to checking that process flow is good and that the final product meets the criteria as specified in the company's own quality procedures. These tests also enable Guerlain to check whether there needs to be investment in the event of non-compatibility with existing lines.

After pilot batch testing, the results gained enable better models to be created. Then the product is finally created, and even if it is not quite the finished product, it enables representatives and subsidiaries to provide a sneak preview, because the promotion side of things will already be under way.

Once everything is deemed in order, the production phase is set in motion. In very general terms, this takes place four months before the distributors' official launch date.

### **The role of weighing in the production phase**

Weighing is first involved in formulating the concentrate, and it is obvious that every one of the sixty to eighty raw materials that makes up the formulation need to be weighed precisely so as to ensure accurate compliance with the formula, given that one dosing error would result in the loss of the entire product, as the product would be non-compliant. The quantities used for formulation are measured here in grammes, milligrammes or even in hundredths of kilogrammes. For small weighing operations, Guerlain has installed PR precision balances. A system has been set up for much larger weighing operations. In cooperation with METTLER TOLEDO, Guerlain has devel-

oped a mobile weighing system, which enables the balance to be positioned directly below the dispensing nozzles, resulting in considerable timesaving for operators.

Once all the raw materials have been mixed to obtain the perfume concentrate, it is then mixed with alcohol in reactors, and these reactors are placed directly on pendulum weighing machines to further eliminate dosing errors.

During bottle filling, weighing plays a decisive role on the production lines; each line is equipped with an SQC system to ensure correct filling. Here the operator selects a bottle directly on the line and weighs it, the result is recorded directly in a database and a record is printed. This has two major advantages, firstly, it ensures proper filling of the bottles, but most importantly, compliance with legislation. If the operator identifies a discrepancy between the weight specified and the weight recorded, this can indicate a fault with one of the components in the chain, and it is therefore possible to intervene very quickly, well before a real system malfunction occurs.

But weighing is not limited to the production processes, it is also used in a wide range of other areas. During testing the bottles are weighed to check that they are properly sealed, by calculating any weight loss. When a work order is issued, all the items that make up the product composition need to be prepared, including small items that are difficult to count (atomizer pumps, caps, etc). Here Guerlain counts based on the weight. Viper balances are used by the processors, who regard this item of equipment as a reli-



# Predictive and preventative maintenance

■ **It is a common mistake to wait until something breaks down before you fix it, and this is often the situation in industry. Time and perceived expense are the most common factors, but in the long run it can save time and costs to prevent rather than cure.**

Maintenance managers have to juggle resources to deal with emergency repairs and find it difficult to implement a preventative maintenance (PM) programme. However, if an effective PM programme is implemented emergencies will be limited.

Many companies perceive a PM programme to be sold from the top down, and often management impose a cost/benefit analysis. However, the benefits of implementing a system are clear - not only the physical costs of equipment repair but also the costs involved in production downtime and bad batch production.

If broken equipment, such as a load cell, is detected and production is shut down expenses will arise. Detailed investigations are necessary to check the quality of all former batches produced and several questions need to be answered:

- When did the breakdown occur?
- What are the effects on product quality ?
- How many batches were affected?
- And why?

And for those conforming to GMP an deviation/investigation report is required and the batches produced will not be released.

**On the positive side – the breakdown has been detected but it could become even more costly.** If the equipment breakdown has not been detected incomplete reactions or impurities may cause bad yield and poor quality and the batch will not be released. If the breakdown goes as far as the product to be sold by weight, manufacturers could lose money by supplying too much or if the weight is less than it should be liable action can be taken against the manufacturer resulting in loss of image and reputation.

The example below is based on the rework/disposal of a 500kg batch of API product because of weighing errors:

## Re-work of batch

|                    |          |                      |
|--------------------|----------|----------------------|
| Cleaning of vessel | £        | 26,500 approx        |
| Material costs     | £        | 33,000 approx        |
| <b>TOTAL COST</b>  | <b>£</b> | <b>59,500 approx</b> |

(without any opportunity costs eg. for breakdown, etc.)

## Dispose of batch

|                    |          |                         |
|--------------------|----------|-------------------------|
| Material costs     | £        | 993,000 approx          |
| Cleaning of vessel | £        | 26,500 approx           |
| Disposal of waste  | £        | 13,000 approx           |
| <b>TOTAL COST</b>  | <b>£</b> | <b>1,032,500 approx</b> |

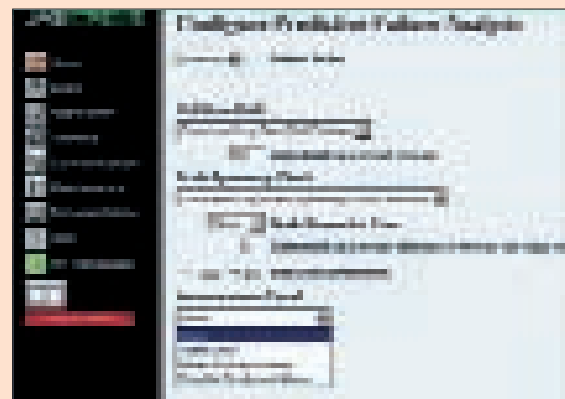
The costs vary from product to product and the quantities produced but it is clear that the cost of preventing such errors will be a small proportion compared with dealing with an emergency breakdown.

## With predictive maintenance:

- Schedule and track equipments own maintenance
- Predicts failures before they occur
- Performs fault recognition and recovery - Run Flat Estimation and Symmetry Check
- Alert individuals of potential failures or maintenance needs by email

## Advantages for the manufacturer:

- Prevents losing money through bad mixture with heavily expensive ingredients
- Don't need to re-work or dispose of a bad batch as special waste
- Keep production upright and reduce downtime almost to zero maintenance hours
- Prevents charging too much or too less



able tool for carrying out their job. And finally, to ensure that the right quantities leave the factory, each pallet is weighed on a weighing pallet truck before being loaded onto the delivery truck.

## Traceability and compliance

Mr Garry, head of Quality Control, insists that traceability should be a concept that is 100% integrated into factory operations. Printing systems are regularly used to complement weighing systems, and the records that are printed are then used to signpost each operator's activity, enabling traceability of a product item's history from its creation through to its delivery and proof that within a given batch components have been properly put together and in the right quantities.

Mr Garry stresses that the compliance of the weighing instruments is equally important, given that the results obtained from them require a kind of blind faith. To this end, Guerlain has signed service contracts that include an annual inspection to ensure that their range of balances and weighing instruments is complete and effective.

Mr Garry also admits that it is reassuring to be able to entrust his equipment to METTLER TOLEDO, since "we all shine at something, and with METTLER TOLEDO it's weighing".