

Food Processing and  
Packaging Machinery



German Pharmaceutical and Cosmetics Machinery

**Safe and reliable**  
**Technology for people**

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# The pharmaceutical industry – A growing market

Manufacturing and packaging machinery for medicinal products forms a small but highly specialized sub-sector of German mechanical engineering. In the competitive international market, it can very successfully hold its own. The worldwide production value is estimated at 7 billion euros. Every fourth machine is built in Germany. With their intelligent processing techniques and innovative filling and packaging concepts, with their excellent service and expertise, the German manufacturers of pharmaceutical and cosmetics machinery make an important contribution to the worldwide supply of medicines and cosmetics. They serve a continuously growing market.

An increasing number of people around the world today have better access to medical care and pharmaceutical products. Rising population numbers and growing prosperity in the pharmerging markets such as China, India, Brazil, Indonesia, North Africa and the Middle East are stimulating further growth.

In the industrialized countries, too, the use of medicinal products has grown steadily. Growth factors here are demographic change and an aging population, increasing civilization diseases, targeted therapies and personalized and new biopharmaceutical drugs for rare, chronic or genetic diseases. Specialized drug therapies will account for nearly a third of global drug spending over the next few years. The importance of blockbuster medicines, on the other hand, will decline and the production of drugs with such a high sales value will be an exception in the future.

## **Profitability – Higher, faster and more flexible**

The growing demand for medicines, the decline in high-volume blockbuster drugs and the growing competition through generic drugs are putting pharmaceutical companies under further pressure. At the same time, the requirements and regulations in terms of quality are increasing. To be able to produce and pack large quantities in a competitive manner, machinery and systems must be able to provide an excellent performance. High output quantities, stable processes and the highest possible plant availability are key factors here. The reduction of downtimes and the minimization of material waste both contribute greatly to efficiency.

## **Sustainability – Saving resources and energy**

Waste is not an option in today's world. Environmental and sustainability considerations are equally fundamental to consumers, pharmaceuticals and cosmetics manufacturers and machinery suppliers. Where technology is concerned, many solutions that help to use and save energy, water and raw materials efficiently are already available. Energy-efficient drives, optimum use of compressed air, reduced water consumption in the manufacture of medicines and cosmetics, water recycling, the use of process heat – all this and much more will influence the energy balance positively and reduce production costs.





## Hygienic Design – Safe and fast cleaning

Residue-free cleaning of machinery and systems is essential in the pharmaceutical and cosmetics industry in order to meet the increasing demands for hygiene, product safety and quality. Machines in Hygienic Design can be cleaned quickly and easily, since the design does not include narrow angles and cavities in which product residues, microorganisms or soil can accumulate. This means a lower cleaning effort, shorter cleaning times and the minimization of material waste. All this will significantly increase the productivity of the equipment.

Optimizing cleaning processes is also of great importance. This means, defined levels of cleaning need to be achieved with the least possible use of resources (time, water, energy, cleaning and disinfecting agents, etc.). Where cleaning machines and systems are concerned, CIP (cleaning-in-place) systems are fully up-to-date. They ensure defined and time-optimized cleaning procedures.

# Modular concepts are gaining in importance – Multi-purpose systems

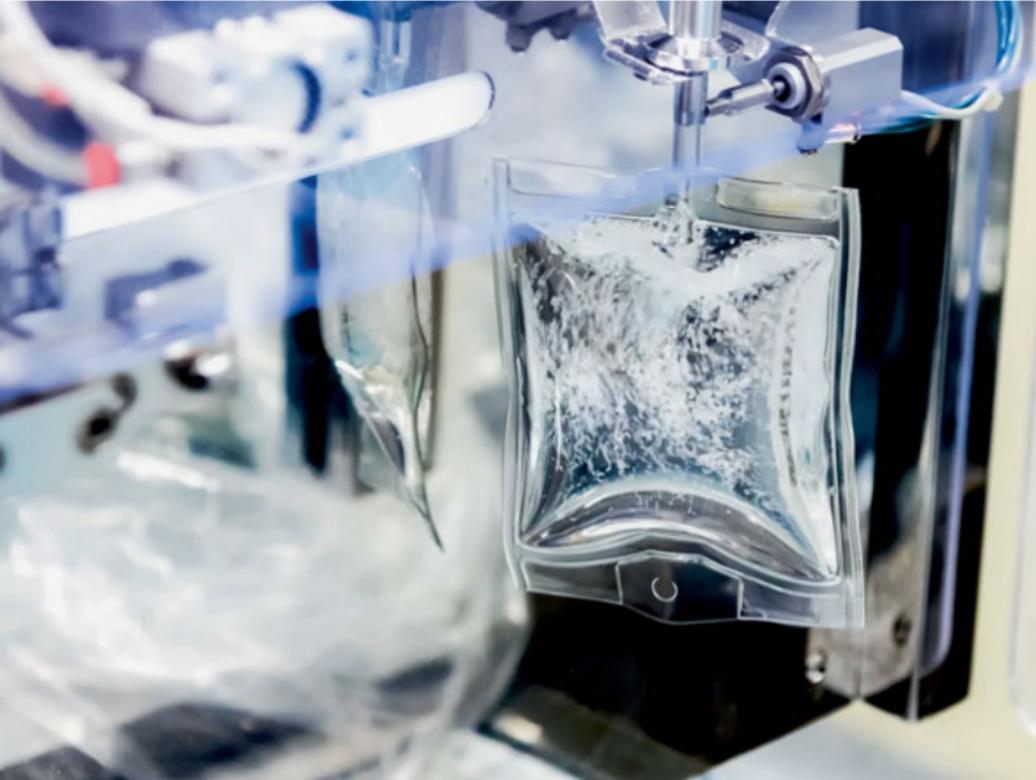
The increase in therapies with personalized medicines and the growing product diversity make the pharmaceutical market very fast-moving. Medicines are made in smaller batches. This requires smaller and highly flexible processing and packaging solutions which can be quickly adapted to the respective product, e.g. by short start-up and cleaning times and a quick and simple format change. Maximum process reliability must be guaranteed.

To bring pharmaceutical products to the market more quickly, to save costs and to increase flexibility, more and more modular concepts are used. Machinery manufacturers offer production lines that can be extended or recombined just as required.

Equipped with scalable and flexible platforms, systems can be adapted to a variety of new products and recipes and can process many different containers. Multi-purpose systems are the right solution as they are designed for a wide range of applications and enable better capacity utilization.



## The current trend: A continuous production process



Where standard production methods for solid pharmaceutical products are concerned, the continuous production process is increasingly becoming an alternative to the traditional batch process. The spectrum ranges from coordinating minimum batches to a fully continuous process. Higher requirements for process understanding (quality by design) are the prerequisite for all processes in comparison to batch processes.

The advantages are: a higher flexibility in batch sizes, a significantly reduced space requirement and above all a faster throughput towards product release. This will result in significantly reduced capital and investment costs compared to the batch process. Demand-pull strategies are therefore easier to implement.

# Single use versus stainless steel

In the production of sterile and biotech products, more and more installations are run using single-use components. During cleaning validation, their advantages become particularly evident as they offer shortened cleaning and changeover times.

There is a wide range of solutions for upstream processing as well as for downstream processing.

But stainless steel installations have their advantages, too: inert materials, no limitation in the batch size, a larger selection of suppliers and – as a result – a lower dependency on a specific supplier.



# Safety has top priority – Containment systems

The production of highly potent drugs is rather complex. It requires precise processes and has high demands on quality, hygiene and safety along the entire value chain. Here, containment systems that protect both the drug from contamination and the operator from harmful substances are in particular demand as they also prevent product losses. The automation and robotic technologies used in this process continue to reduce the human contact with the substances.

Powerful and fully automatic process analysis (PAT) is also required to meet the growing demand for pharmaceutical quality. PAT ensures strict adherence to pharmaceutical quality and safety standards. The ultimate aim is to release production batches based on quality and process parameters recorded inline or nearline (real-time release).



## Giving fake drugs no chance

Security is of paramount importance in the manufacture of medicines. This applies both to the production process and to packaging. The number of counterfeit drugs is increasing worldwide. The risk for patients is high and often fatal, while to pharmaceutical manufacturers fake drugs mean high turnover losses and image loss. Legislators around the world have recognized the dangers of drug counterfeiting and responded with appropriate guidelines.

One solution of addressing the problem of drug counterfeiting is the serialization: packaging must be provided with a unique, unpredictable serial number. This makes sure that the products can be unambiguously assigned not only to the batch but also to the individual sales package. With highly efficient computer-aided track & trace systems, products can be traced completely throughout the entire value chain. For example, using a smartphone, you can check at the point of sale or at home whether it is an original product.



# The beauty boom



Beauty, success, recognition – these are the wishes that make consumers choose cosmetics worldwide. They do not shun expenses to achieve a beautiful, well-groomed appearance. Creams, gels, lotions, eyeshadows, mascara, lipsticks, perfumes – the range of personal care and cosmetic products is vast and new products are added every day. Flexible machines are needed here, which can produce small batches economically. Today, modern cosmetics machines make mass customization possible.

In the field of body and dental care, on the other hand, low unit costs are vital, since the margin pressure is particularly high here. High-performance machines, which produce low unit costs with high availability, are in demand.

High-priced branded cosmetics increasingly have an authenticity protection device integrated into the packaging. Machines ensure the reliable application of the necessary safety features such as, for example, matrix codes, security inks or tamper-proof seals. A smartphone app for instance will then enable the consumer to check later whether he bought an original branded product.



## 14.0 or the internet of things – Machines for agile production

Production digitization is already in full swing. The goal is agile production, which adapts to an ever-changing demand. What is needed are machine concepts that can produce small batch sizes economically, enable rapid delivery without increased storage, and can be integrated into a production control system which interconnects various locations. The long-term objective is that the order actively „seeks out“ its production and packaging plant. The job „controls“ the process.



## Customized solutions „made in Germany“

From simple technology to the high-end machine: German manufacturers of pharmaceutical and cosmetics machinery cooperate closely with their customers to develop precisely the processing and packaging solution that meets their specific needs – depending on country and region. This includes a comprehensive service and maintenance range as well as the training of the operating staff. When machines from Germany are used for the production and packaging of medicines and cosmetics: commitment and passion are always part of the deal.

# **VDMA – The Network of the German capital goods industry**

VDMA (the German Engineering Federation) represents more than 3,200 predominantly SME member companies of the capital goods industry and is the largest industrial trade organization in Europe.

## **The Food Processing and Packaging Machinery Association within VDMA**

The Food Processing and Packaging Machinery Association is one of the largest of 38 industry-specific associations within VDMA. The many different engineering products produced in this field make it a very heterogeneous sector:

More than 300 member companies manufacture bakery machines, meat processing machines, beverage production and dairy technology, confectionery machines, machines and equipment for vegetable raw material processing, packaging machines, and machinery and installations for producing pharmaceutical and cosmetic products.

Where economic and technical topics are concerned, the Association supports its members in their day-to-day work.

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## **VDMA**

Food Processing and  
Packaging Machinery

Lyoner Str. 18  
60528 Frankfurt am Main  
Germany

## **Contact**

Phone +49 69 6603-1432

Fax +49 69 6603-2432

E-Mail [nuv@vdma.org](mailto:nuv@vdma.org)