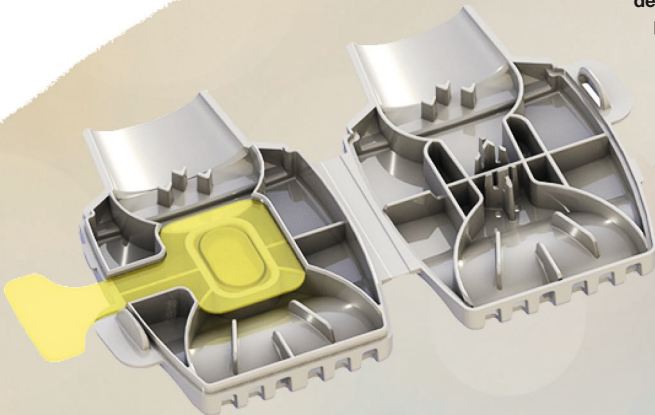


As light as the flap of a butter- fly's wings

Inhaler development is a complex field. Hovione Technology wants to make life easier for pharmaceutical companies and patients with the Papillon dry powder inhaler.



Hovione Technology. Illustration: Megan Bird, Background: Freepik.com



Insert the blister, close the device, inhale: Thanks to its simple design, it is easy for patients to use.

Developing a new inhaler is a laborious process. Extensive tests are required to ensure that the device truly works. The more complex it is, the greater the number of design and manufacturing relationships that have to be determined, and the more malfunctions can occur: during an inhaled combination development, pharmaceutical companies have to consider not just the drug product and device, but also how they interact with each other. This is often reflected in the development time and costs.

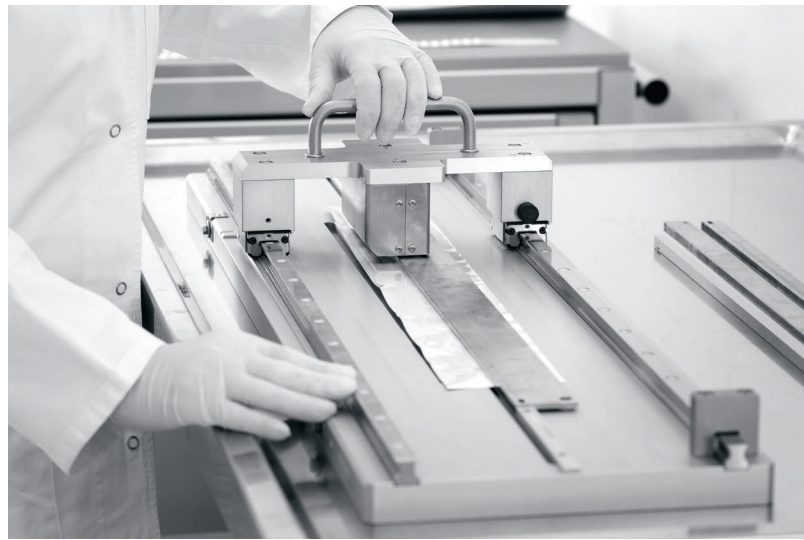
Hovione Technology wants to help these pharmaceutical companies enter the market faster and has developed the Papillon dry powder inhaler for this purpose. The name – Papillon is the French word for butterfly – says it all: The device aims to be simple and light. Because unlike other inhalers, which can consist of up to 26 components, it only consists of two reusable plastic components and one blister. This makes it easy to produce and reduces the complexity and cost. João Ventura Fernandes, Director of Technology Development and Licensing from Hovione Technology explains: “A lot can go wrong with complex devices and data shows that inhaled drugs can be delivered as effectively from devices made of very few parts and assem-

“The Papillon is designed so simply that pharmaceutical companies only have to test a few functions before starting development.”



João Ventura Fernandes, Director of Technology Development and Licensing at Hovione Technology

bly steps. The Papillon is designed so simply that pharmaceutical companies only have to test a few functions before starting development.



The production and filling of the sample blisters for the Papillon takes place directly at Harro Höfliger.



This saves time and money, so that focus can be put on powder development.”

Easy patient use

The Papillon was also designed for easy patient use: They only need to insert the blister and close the device and then they can inhale. For the next inhalation, they simply insert a new blister, because the Papillon can be reused many times. This way, it hardly generates any waste. “We want to make life easy for patients while at the same time improve the environmental sustainability of inhalers,” says João Ventura Fernandes.

Pharmaceutical companies can use the dry powder inhaler in many different

application areas. This is because the design can be adapted to an individual or double blister configuration. The double blister version makes it possible to administer two separate powders in parallel and simultaneously. The inhaler is also suitable for acute treatments, such as an antibiotic administered in a high dose to combat a lung infection.

Many different powder technologies

Different pharmaceutical companies are currently testing the device with their formulations. The right filling technology plays a key role here. João Ventura Fernandes says: “Harro Höfliger has a great deal of know-how and a wealth of expe-

rience in powder filling. No other machine manufacturer offers as many different technologies for filling powder. By cooperating with Harro Höfliger, we make it even easier for our customers to use our inhaler for their purposes and, following development, to smoothly scale-up to industrial-scale filling for commercial stages.”

If a customer shows interest in the Papillon, Harro Höfliger carries out preliminary filling tests with their powder as the first step. Then Harro Höfliger sends filled sample blisters to Hovione Technology or the end customer so that they can test whether the interaction of the device and powder works. It is extremely complex, because all powders behave differently. Some flow well, others lump. In addition, the different filling technologies affect the powder to different degrees, for example due to the shear or compression forces. Finally, the adhesion forces between powder particles must be overcome in the inhaler. Only then can the powder be so finely dispersed that the active ingredient penetrates deep enough in the patient’s lungs and does not get stuck in the throat or in the upper airways.

Nothing is impossible

But what happens if the interplay does not work at first? Marco Laackmann, Director Inhalation Technology at Harro Höfliger, says: “Harro Höfliger is distinguished by the fact that we can also overcome special challenges – for example, filling unusual powders.” In their Pharma Services department, Harro Höfliger offers extensive options for optimizing the filling process for the respective powder. Laackmann explains: “In one past project, for example, the metered powder slug was too large, so the inhaler did not work fully. Instead, we filled it with several small powder slugs. That worked.”

During product development, the filling process is always the first thing to be sorted out. If no solution can be found, adjustments can also be made to the blister or device to optimize them. If this also does not result in any improvement, the formulation can be adjusted. Laackmann sums it up: “Perhaps it is not always as easy as the flap of a butterfly’s wings. But together with Hovione Technology, we will always find a solution so that customers can use the Papillon for their formulation.” ■



Hovione Technology, Illustration: Megan Bird, Background: Freepik.com



About Hovione Technology

Hovione Technology offers access to a full range of innovative, cost-effective dry powder inhalation devices: disposable, capsule-based, blister-based and large dose DPIs. With over 20 years of expertise developing innovative inhaler technology, Hovione Technology’s team has been behind the first market-approved disposable dry powder inhaler for influenza treatment, the TwinCaps® DPI, and the new market-approved capsule DPI for Asthma and COPD management, the PowdAir® Plus DPI. Millions of patients are being treated every year with Hovione Technology’s inhalers.

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