Strip packaging technology pushes sustainability boundaries

Romaco Siebler and Huhtamaki are adopting new approaches to primary packaging for pharmaceutical solids with push-through strips, known as push packs. Andreas Detmers, head of technical solutions at Romaco Pharmatechnik, takes a detailed look at the benefits of this new technology.

Climate-friendly, material-saving, affordable, customisable and ultra-thin – Romaco Siebler's push pack manufacturing technology heralds in a new era in primary packaging for solid pharma products.

Romaco Siebler partnered with Huhtamaki, the Finnish film and foil specialist, to develop its push pack product family. It is currently the only machinery supplier in the market with the capability to process the new, ultra-thin, PVC-free Huhtamaki foils into safe and absolutely tight pharmaceutical packs.

These push-through strip packs are the partnership's alternative to the established blister packaging forms currently on the market. Push packs provide equivalent barrier properties to blisters and are opened in the same way – you simply press the tablet out of the push pack with your thumb. They are also similar in appearance to conventional blister packs.

Major cost saving

Since push packs are sealed all round with two foils, far thinner aluminium barrier layers can be realised than with cold-formed blisters. The thinner barrier ranges between 9µm and 25µm depending on the primary packaging's barrier specifications. With aluminium-aluminium blisters, because the aluminium is deep-drawn, a much thicker foil is inevitable. This is why a cold-formed aluminium-aluminium blister weighs more than twice as much as a high-barrier push pack produced on a Siebler strip packaging machine.

The markedly lower material consumption is complemented by significant cost economies: a potential saving of up to 60% is possible compared to standard aluminium-aluminium blisters.

"Push packs help pharmaceutical companies to not only reduce their carbon footprint but also their production costs," explains Rolf Izsak, the product manager responsible for push pack development at Romaco Pharmatechnik.

The standard and high-barrier push pack versions are manufactured from a five-layer, laminated PE or surlyn, aluminium and PET foil supplied by Huhtamaki. The foil's push-through function is achieved by perforating the outer PET layer. In the standard version, push packs have an aluminium barrier layer, either 9µm or 12µm thick. High-barrier push packs, which have to meet very high air, light and moisture tightness requirements, are made using 25µm aluminium foil. What's more is these push packs contain zero PVC, which is considered harmful to human health and the environment.

A world first

Both the standard and high-barrier push packs have a much better eco-profile than blister packs. Yet Romaco and Huhtamaki have gone one step further, introducing the world's first recyclable strip packaging for pharmaceutical solids.

> *"Push packs help pharmaceutical companies to **not only reduce their carbon footprint but also their production costs**"*

The eco push pack version consists of polyolefin laminate, which can be disposed of as recyclable material. An impressive 70% or more of the material can be recycled back into the material loop. The key lies in the unique structure of the Huhtamaki foil – recyclable push packs comprise over 90% polyethylene and polypropylene, which belong to the same material class.

Huhtamaki's special new foils were tested extensively on a Romaco Siebler HM 1-230 strip packaging machine at PacTech, the Romaco laboratory located in Karlsruhe, Germany. The optimum sealing conditions were determined while the foils were subjected to various leak tests.

"We decided to develop our new, push-through foils in partnership with Romaco because we've worked together effectively in the past. Romaco and Huhtamaki are two companies with complementary expertise," reports Fabio Daidone, senior sales manager at Huhtamaki.

Unique heat-sealing technology

Romaco Siebler's strip packaging machines are designed to process a very wide range of heat-sealable materials, from paper-aluminium foils and plastic to polyester. To enable safe and absolutely tight pharma packaging to be manufactured from the new Huhtamaki foils, the Siebler heat-sealing technology was specially adapted to handle laminates with an aluminium foil thickness of between 9µm and 25µm.

"Our heat-sealing machines are currently the only ones on the market capable of processing Huhtamaki's ultra-thin foils into primary packaging, in line with the pharma industry's safety and tightness requirements – and doing so using recyclable materials," says Izsak.

Push packs are manufactured on the Romaco Siebler HM 1 series of vertical heat-sealing machines, which can pack up to 7 000 tablets per minute.

The HM 1-350 and HM 1-600 models (with a maximum foil width of 350mm or 600mm) are also suitable for this purpose in addition to the HM 1-230 type with a maximum foil width of 230mm.

In future, it will also be possible to produce push packs on heat-sealing machines in the Romaco Siebler HM 2 series.

HM 2 machines are designed to pack medical devices like pre-filled syringes or eye drops in unit doses, which have to be fed horizontally due to their geometry.

Die-cut packaging formats

Freely selectable packaging formats – or the so-called design strips – can be realised on Romaco Siebler's strip packaging machines. For this purpose, the machine can be equipped with a continuous cutting station at the customer's request. Two servo-driven punches then cut strips out of the foil layer with a drawing cut.

"Round or star-shaped, stylised hand, a 'thumbs up' look or just about any other format is possible," Izsak comments. "The ability to customise shapes and sizes allows pharma and healthcare companies to give their primary packaging an attractive and distinctive appearance with high recognition value, setting themselves apart from the competition." Push packs also offer several compelling arguments from a marketing perspective. They can be printed on both sides and have a larger print area for targeted marketing messages than is possible with blister packs.

DID YOU KNOW?

Thanks to the tear-resistant PET film, children find it extremely difficult to open push packs whereas seniors or an elderly person can press out the tablets without any difficulty. Medicines packaged in push packs also have a longer shelf life due to the relatively small cavities, which result in smaller air pockets.

Effervescent tablets

Tablets and capsules in numerous shapes and sizes can be packed in push packs on heat-sealing machines from Romaco Siebler – even large effervescent tablets, which are highly sensitive to humidity.

To make effervescent tablets, a tablet press must be installed upstream of the heat-sealing machine. The tablets are fed to the Siebler HM 1 on conveyor belts and packed directly in push packs following the compression process.

"We advise our customers to consider one of Romaco Kilian's tablet presses for manufacturing effervescent tablets, because they're fine-tuned for use with Romaco Siebler strip packaging machines," Izsak comments.

Romaco Siebler proposes two alternative solutions for transferring the strip packs to the modules positioned downstream:

1. Belt transfer with Siebler FixTrans is especially appropriate for large batches with identical pack widths. It impresses with a high transfer speed, reliable processes and cost-efficiency.
2. Siebler FlexTrans, the servo-driven transfer solution, features a pick-and-place system designed to process smaller batches with different pack sizes and enables more flexibility if the strip layout or stack height varies.

Romaco Promatic cartoners and case packers can then be used for the secondary and final packaging. Ultimately, Romaco customers can reap all the benefits of a complete production line from a single source.

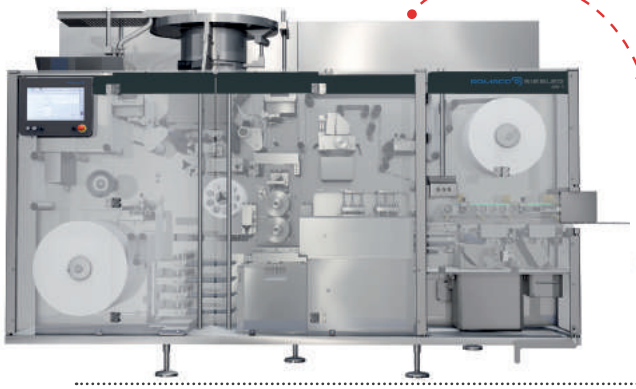
First product tests under way

At PacTech in Germany, the first product tests with standard and high-barrier push packs are currently under way. These tests are being conducted on behalf of various leading pharmaceutical customers. The first project enquiries for the new recyclable push packs have already been received by Romaco. The recyclable version was officially unveiled to a wider audience at the CPhI trade show in Frankfurt, Germany, in November 2019.

Izsak says, "The huge interest in our push pack product family and particularly the recyclable strip packs is confirmation that 'sustainability' is also becoming top of the agenda in the pharmaceutical industry. That's why we're committed to optimising our push pack technology even further in the future and to moving forward decisively with sustainability initiatives in other product segments too."•

Romaco Group – push-packs.romaco.com
Huhtamaki – www.huhtamaki.com

▼ Push packs are manufactured on a Romaco Siebler HM 1 heat-sealing machine



▼ The recyclable push packs are made from polyolefin laminate