Mpac Langen

GUIDE

Infeeds the essential element

Ingenious Packaging Machinery and Automation Solutions

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Infeeds are an essential element of integration into any secondary or end-of-line packaging solution. They are the vital connection to automatically transfer products from upstream production machines to downstream machinery for cartoning, followed by case packing and palletizing. The challenge is to make this transfer happen seamlessly and reliably.

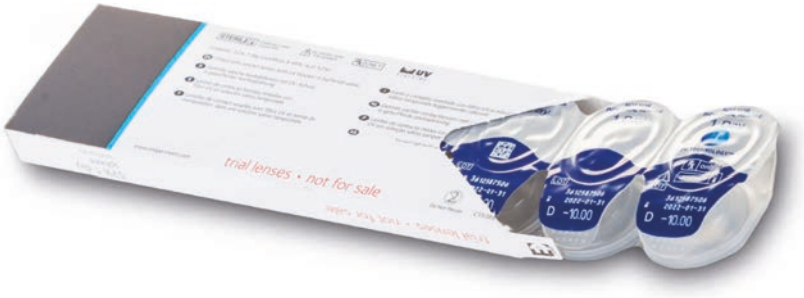
To determine the type of infeed best suited to handle the product, all variables must be considered, including the factory layout, accessibility, type of product and the type of application. Just like packaging machines, infeeds are tailor-made to fit the client's specific application and seamlessly connect to upstream and downstream machines. Infeeds can vary in complexity, ranging from simple and effective equipment solutions to complex high-speed systems to receive products from single and multiple upstream machines.

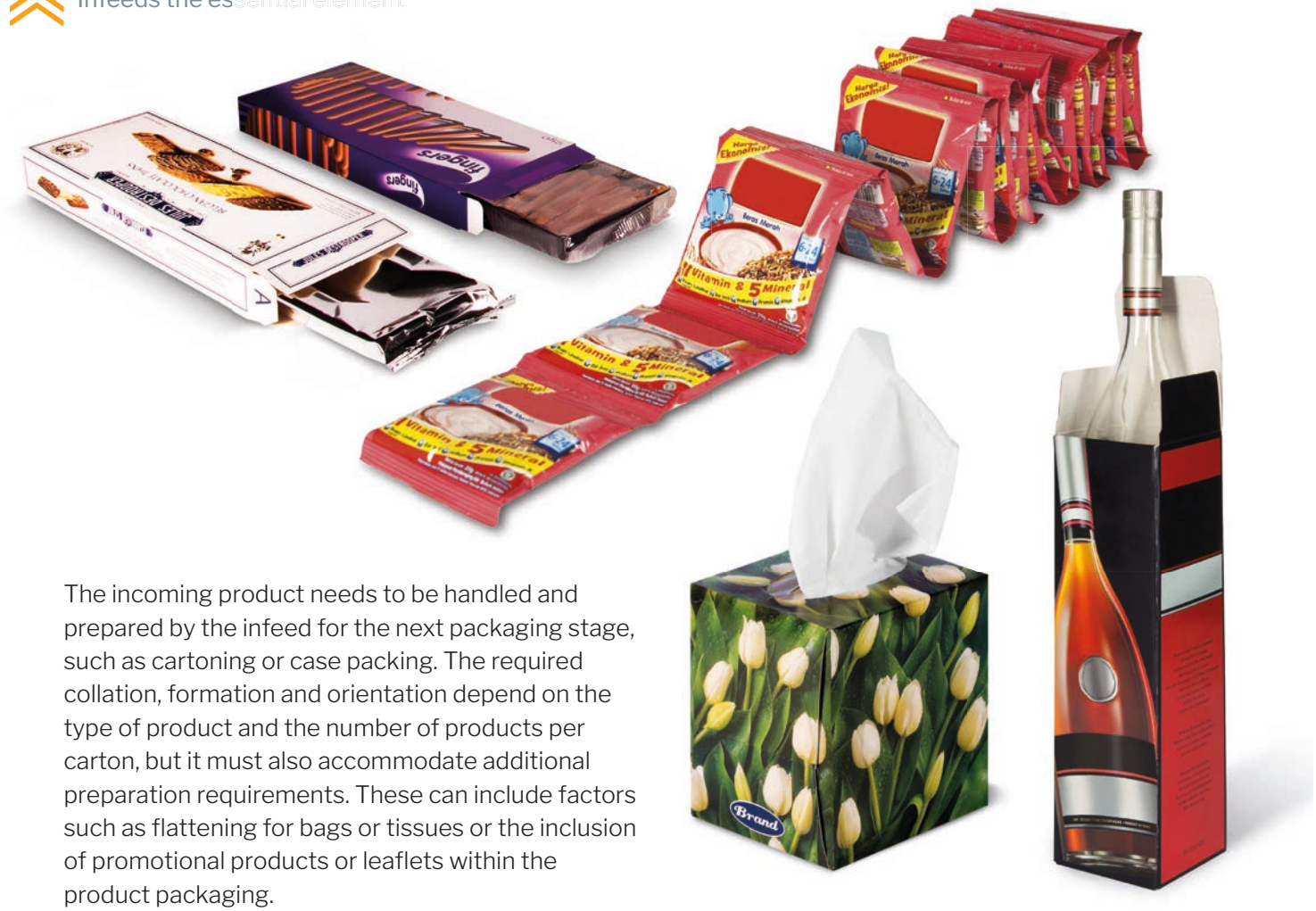
At Mpac Langen, we have a great deal of expertise in designing infeeds and packaging machinery for food and beverage, healthcare and pharmaceutical applications. Our diverse cross-industry experience is regularly used to benefit customers from other industrial sectors as well – allowing us to leverage our experience and apply smart ideas to similar technical challenges across different sectors.

Designing infeeds

Designing an infeed solution that will operate flawlessly and integrate perfectly, requires a great amount of product handling expertise and experience. Even though many infeed systems are based on standardised solutions, they need to be tailored to the specific application, product specifications and product presentation. In some cases, a bespoke infeed system is required.

Many variables influence the design of the infeed, including the speed of the packaging line, the number of lines and the collation, formation and orientation requirements of the product. The product characteristics are also a vital factor to ensure that at each stage of the process products are handled and packed with care. Realising a seamless transfer from the production line or upstream primary packaging equipment to the cartoner may require synchronising of speeds or collation of products to match the speed of the cartoner.





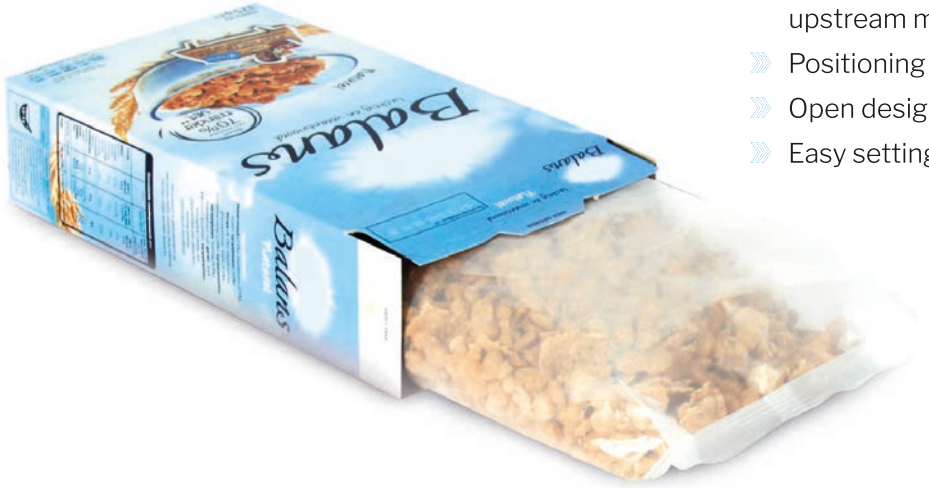
The incoming product needs to be handled and prepared by the infeed for the next packaging stage, such as cartoning or case packing. The required collation, formation and orientation depend on the type of product and the number of products per carton, but it must also accommodate additional preparation requirements. These can include factors such as flattening for bags or tissues or the inclusion of promotional products or leaflets within the product packaging.

Our portfolio includes proven infeed solutions for applications such as:

- Bars, flow wrapped products and trays
- Sticks
- Bag-in-box
- Pouches/sachets
- Bottles
- Tissues
- Consumer goods
- Personal care and cosmetics.

Designing the optimal technical infeed for product handling is crucial but the system also needs to be integrated into the packaging line in a factory setting. An effective solution needs to take factors into account, such as the layout of the factory, possible space restrictions and the connection to upstream and downstream machines. Practical considerations also need to be evaluated, such as:

- Product handling
- Ergonomic design
- Visibility on product flow
- Accessibility for cleaning and maintenance
- Integration into the software program of the upstream machine
- Positioning of the infeed
- Open design
- Easy setting



The importance of software

Along with reliable hardware, software is a crucial factor when designing infeeds. Depending on the application, electronics and software are crucial to the entire process operating seamlessly. For example, a high-speed infeed needs the ability to detect, count, synchronise and orientate products at high speed across multiple lines. Faults need to be detected automatically and corrected. At the same time, the software is an important tool in ensuring product traceability.

Since each infeed is tailored to the product and client requirements, the software functions are adapted to meet the specific needs of each project. At Mpac, we greatly value our in-house software engineering expertise which is of vital importance when designing successful infeed systems.

Where needed, we use strategic collaborations with external suppliers to ensure that we remain fully up to date with technical developments and emerging trends, such as the latest camera-based vision systems to check product quality or the use of specialist insight and technology for high-end applications.

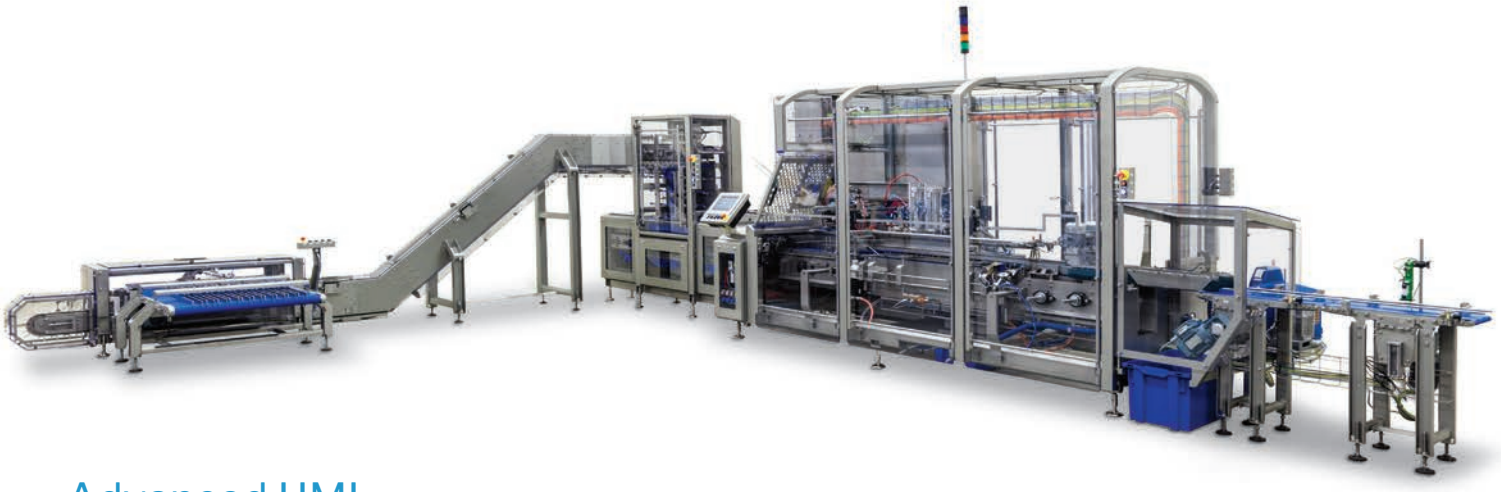
The role of packaging machine service and support solutions

Reliability is a vital aspect of any infeed system. An infeed system, which is ergonomically designed, brings the advantage of good visibility on the product flow, as well as easy accessibility for cleaning, maintenance and servicing, which is crucial to increasing uptime.

We comply with international industry technical standards to ensure reliable operation and perfect compatibility with upstream and downstream machines. These standards include European Conformity (CE) and Underwriters Laboratories (UL)/ Canadian Standards Association (CSA).

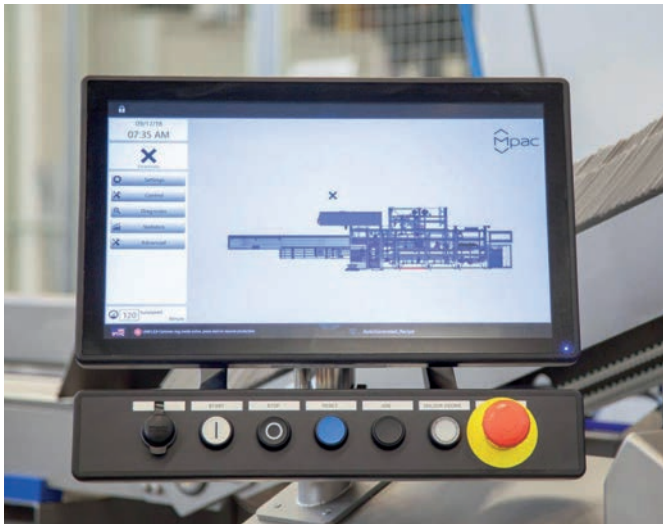
Furthermore, PackML (Packaging Machine Language) is integrated with all Mpac Langen packaging machines. Its primary objective is to bring operational consistency to all machines within a packing line. PackML provides standard defined machine states and operational flow, overall equipment effectiveness (OEE) data, root cause analysis (RCA) data and flexible recipe schemes and common supervisory control and data acquisition (SCADA) or manufacturing execution systems (MES) inputs.

In addition to the standard communication protocols, we make use of a ‘computer handshake’ with the upstream and downstream machines. This allows for a seamlessly integrated packing line that will run as one efficient unit. Smooth and fully integrated communication means optimal line control and performance with the possibility to track products and record data such as ID number, lot number, operator ID and best before date. Also, faulty products are rejected by the infeed system so that adaptations can be made seamlessly during operation, avoiding production stops and costly downtime.



Advanced HMI

To be prepared for the possibilities industry 4.0 has to offer, we've fitted our packaging machinery with the same newly developed human-machine interface (HMI). It enables features such as condition monitoring, predictive maintenance, video instructions and remote troubleshooting and assistance. Our advanced HMI is Windows-based and serves as a platform for future developments. This allows us to evolve and augment our system according to our customer's needs. When multiple machines and devices are used in one line they can all be accessed from the one HMI screen. If required, the customer can also allow Mpac Langen access to monitor the performance of their equipment, either directly or via the cloud, to help optimise system efficiency and improve quality.



Infeed secondary packaging equipment

We offer a range of standardised infeeds for secondary packaging equipment.

Type	Description
Stick pack infeed for bags	Semi or fully automated stick pack packaging system into bags – integrated with semi-automatic feeding using pre-made bags or fully automated with the Vertical Form Fill Seal Machine (VFFS). The system uses Mpac Langen's Flexcount system offering single stick pack counting and collation with very high-count accuracy, wide range of speed and for a variety of stick packs and bag styles.
Stick pack infeed for cartons	Fully automated stick pack packaging system into cartons – integrated with the horizontal cartoner – using Mpac Langen's Flexcount system offering single stick counting and collation with very high accuracy, wide range of speed and for a variety of stick packs and carton styles.
Stick pack infeed for cases	Fully automated stick pack packaging system into cases – integrated with conveying system – using Mpac Langen's Flexcount system offering single stick counting and collation with very high accuracy, wide range of speed and for a variety of stick packs and case styles.
Linear Servo Pack (LSP)	Single lane compact, accurate and simple indexing infeed system that enables asynchronous operation between the infeed and standard indexing or continuous motion carton loading. It uses 2 or 3 individually driven chains or belts each with a number of buckets for product transport.
Pivoting (direct infeed in carton)	Fast feed system to load bars, flow-wrap products and bags directly into a continuous motion running carton at rates of up to 90 cartons/min. Uses pivoting nose technology – integrated at the non-operator side of the machine – consisting of an infeed conveyor with side belts that moves along with the erected carton and accelerates the product to insert it into the carton.
Linear Servo Pack (LSP) + Delta picker	Fast and highly flexible delta robot infeed system to load bars, flow-wrapped products or pouches from 1 or 2 upstream conveyors into the buckets of a continuous motion cartoner, using an LSP to disconnect the infeed from the bucket loading. Product formations in different orientations can be made, such as in a stack, next to, or behind each other.
Star wheel infeed system	Fast and flexible star wheel feeding system to load previously filled bags and pouches into the bucket of a continuous motion cartoner. It typically runs in synchronisation with the upstream filling machine at a rate of up to 100 ppm, directly or with the help of servo driven staging conveyors. Multiple systems can be connected in parallel operating to a bucket conveyor.
Hinged vertical cascade loading system	Flexible 3- or 4-level vertical cascade or 'bomb-bay' infeed system to load bags and pouches from an upstream conveyor into the bucket of a continuous motion cartoner at a rate of up to 80 ppm. No synchronisation with upstream equipment required. Multiple systems can be connected in parallel operating to a bucket conveyor.
Index conveyor with pusher	Simple infeed system of single or multiple products directly into the bucket conveyor of an indexing cartoner, which is in a holding position, and then loaded from the bucket into the carton by a pneumatically or servo driven pusher.
Tissue infeed	Fast feed system to bring and orientate tissue clips – which are indexed by a 3-stage smart conveyor system and then passed by a rotation system to transfer them from a short side leading orientation to a long side leading orientation – into the buckets of a continuous bucket conveyor.

Type	Description
Dead plate (higher back wall)	A simple and compact, single or double lane infeed system to load solid or flow-wrapped products arriving from an upstream conveyor into the bucket of a continuous motion cartoner. The products are synchronised with the cartoner by a product smart dosing system, accelerated and moved on a dead plate with a window equal to the pitch of the bucket conveyor.
Overhead square and inline	Fast feed system to load square or inline incoming flow-wrapped products directly into the bucket of a continuous motion cartoner, either in single or multiple formations. It uses an overhead paddle chain that can be used in a 90-degree square or inline setup depending on layout and product specifications.
Pull nose	Fast feed in-line conveyor system to bring larger, wrapped incoming products into the bucket of a continuous motion cartoner – using a pull nose that follows the buckets for a smooth transfer of the indexed products. Products may also be stacked, while running in continuous motion, by setting the speed ratio between the pull nose and bucket conveyor.
Screw infeed	Simple, high-speed in-line infeed system for smoothly spacing regular shaped products – such as bottles, jars or cans – using a screw system and transferring them sideways into the bucket of a continuous motion cartoner.

Infeed end-of-line packaging

We offer a range of standardised infeeds for end-of-line packaging equipment.

Type	Description
Linear Servo Pack (LSP)	Single lane compact, accurate and simple indexing infeed system that enables asynchronous operation between the infeed and standard carton loading machines, using 2 or 3 individually driven chains or belts with several buckets for product loading.
Carton stacker	Simple and flexible infeed system to stack cartons in different formations.
Carton formation table	Simple and flexible infeed system with sideward movements to create different carton formations on a table.
Chain-folding	Dedicated infeed system to receive chains of sachets in single or multiple lanes and create zig-zag formations of chain-packed pouches in each lane, forwarding them on a conveyor to a formation table for collation.

Infeeds – the essential element

Each of the many different types of infeeds offers unique properties for realising a packaging solution tailored to the product and customer requirements and they are an integral part of any efficient packaging line.

For more details on Mpac Langen's infeed systems visit the solution pages on our website or contact us.

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mpac-group.com

AMERICAS
T +1 905 670 7200
E sales.americas@mpac-group.com
E service.americas@mpac-group.com

EMEA
T +31 24 648 66 55
T +44 24 7642 1100
E sales.emea@mpac-group.com
E service.emea@mpac-group.com

APAC
T +65 63 399 666
T +66 23 021 400
E sales.asia@mpac-group.com
E service.asia@mpac-group.com