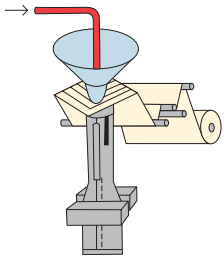
Making our world more productive

# MAP – Packaging machines

Crisps packed on a vertical flow-pack

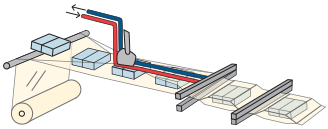
# Packaging machines for individual products

There are five main groups of packaging machines that use modified atmosphere packaging (MAP) technology, depending on the type of product and type of packaging. Although these machines are based on different principles, the basic mode of operation is the same. First, a package is formed (or prefabricated packages are used) and filled with the product. Then the air in the package is replaced by a modified atmosphere. Finally, the package is sealed. These three steps take place either manually or automatically. The methods used to modify the atmosphere include gas flushing or vacuum extraction and then gas injection. The specific gas consumption depends on the type of machine. In gas flushing, the air surrounding the food inside the package is replaced by means of a continuous gas stream before the package is sealed. A continuous flushing process enables high packaging speeds. In the vacuum process, air is extracted from the package and the resultant vacuum is broken by injection with the desired gas mixture. Since this is a two-step process, it is slower than the gas flushing method. However, because the air is almost totally removed, the efficiency of this process with regard to residual oxygen levels is better than in the case of gas flushing.



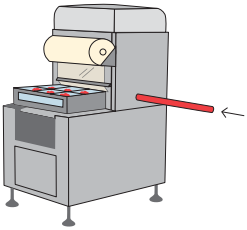
## Vertical flow-pack

A film is formed into a tube that is pinched together at one end and sealed over an injection pipe. The product is portioned out into the tube, which is then sealed at the other end and cut off. Gas is continually fed through the tube to purge the air. This machine is mostly used for powdered and bulk products such as coffee and peanuts as well as diced foodstuffs. Sometimes gas flushing may be necessary before packaging.



## Horizontal flow-pack

The foodstuffs are fed into a horizontal flowing tube that is constantly formed by a packaging machine. The tube is sealed and cut off along both sides of the product. Gas is flushed into the resultant bag, purging the air. This equipment works fast and uses less complicated film material than a deep-drawing machine. Typical foods are bakery products, sausages, cheese, pizza and salad leaves.



## Tray-sealer machine

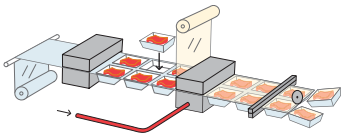
The tray sealer can be operated manually, semi-automatically (illustrated here) or continuously depending on production volumes. This machine can be compared to a deep-drawing machine, but the bottom trays into which the product is placed are ready-made and not formed during the process. Depending on the foodstuff and marketing requirements, a wide range of trays can be used with the tray-sealer machine. These machines are used for most food products, e.g. ready meals, salads, meat and fish.

Gas flow

Gas analyser

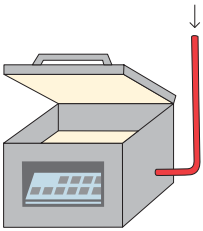
## Deep-drawing machine

Film is heat-formed into a tray at a drawing station and the product is then added. Air is extracted, gas is injected and the loaded package is then sealed with a top film. This machine is suitable for foodstuffs such as meat, fish and prepared foods.



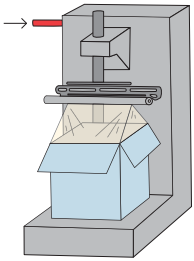
## Vacuum chamber machine

The product is inserted into prefabricated bags or trays. The packages are placed in a chamber from which the air is extracted and the pressure is then equalised with gas. The packages are then sealed. This machine type is suitable for small, low-cost production volumes.



## Bag-in-box sealing machine

Prefabricated bags are filled with the product. A probe is introduced into the bag and air is extracted. Gas is then fed in, the probe is removed and the bag is sealed. Such equipment is used for large packages of meat, poultry and fish, for example.



Packaging of vegetables with flow-pack machine

**Linde Aktiengesellschaft**
Gases Division, Carl-von-Linde-Strasse 25, 85716 Unterschleissheim, Germany
Phone +49 89 31001-0, www.linde-gas.com/mapax



05_0000303_TICS_1019