

Keeping fruit and vegetables fresh

PerfoTec has developed a laser capable of making miniscule perforations in packaging. These customized perforations allow the fruit to 'breathe' thus prolonging its freshness a few more days. This system is perfectly aligned with the current focus on reducing food waste.

systems on the packaging lines of Marks & Spencer and are in discussion to expand to other product groups.

Soft fruit is its prime market

Since 2005 the company has installed approximately 100 laser systems worldwide. "But the bulk of it is in Europe," explains technical director, Martijn de Bruin. Soft fruit is the prime market for PerfoTec followed by cut vegetables such as sachets of pan-ready vegetable mixes; broccoli rosettes; beans; spinach and salad melanges. Potatoes also benefit from perforated packaging. This way, green discolouration of the peel and the sprouting of germs is delayed. Harvested vegetables and fruit from various plants have different respiration speeds; some breathe at a more rapid pace while others



The camera checks every micro-perforation according to diameter and shape.

Several major European retailers are already using the laser system of PerfoTec. Supermarkets are able to reduce the volumes of fruit and vegetable waste with this system. The British supermarket chain Marks & Spencer conducted various tests with fresh grapes, raspberries and strawberries in

2014. The company succeeded in increasing the shelf life from 5 to 7 days for grapes, 5 to 10 days for raspberries and 4 to 8 days for strawberries. As a result of the extended shelf life food losses in shops have been reduced by 50% resulting in significant savings as well. PerfoTec installed 21 laser

AMAP technology

Fresh vegetables and fruit need a minimal amount of oxygen to thrive. If they receive too much oxygen they get old rapidly. When there is too little oxygen an anaerobic situation will arise leading to faster decay. With PerfoTec's laser system, packaged fruit and vegetables can reach its maximum shelf life by applying miniscule perforations in the packaging that regulates the respiration within. In this way fresh packaged fruit, vegetables and potatoes can last a few days longer. It saves money and leads to less food waste.



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breathe at a relatively lower tempo. The respiration speed also varies according to the season or region even for the same variety of fruit or vegetables. In the past the quantity and size of the perforations were determined via trial and error. Now with the respiration control the speed at which the product breathes can be determined within four hours thus indicating the optimal number of perforations needed to ensure a longer shelf life. “This respiration control is vital,” De Bruin says. Growth conditions such as the weather and irrigation influence the respiration. De Bruin makes an example of iceberg lettuce. “A supplier first retrieves the lettuce from the Netherlands and once this is no longer available he retrieves it from Spain and then from Egypt. All this influences the shelf life of the lettuce.” With PerfoTec’s system the permeability of the packaging can be adjusted to the varying degrees of respiration of the lettuce from the various countries and retains a perfect atmosphere in the packaging. According to De Bruin quality is a choice. “We can maintain the ideal atmosphere so that the products, such as fresh lettuce for example, remains fresh for as long as possible.”

The laser system

In summary, the company’s laser system consists of three units: the laser with intelligent camera, the software and the respirator. It is designed for the integration within all possible packaging machines and alu-

minium converters.

The laser makes highly accurate round perforations which is essential for AMAP technology (see box). The system is available in three sizes, the PER30, 100 and 200/300/400. The smallest variant, PER30, was introduced in 2014 due to market demand for a smaller and cheaper laser.

The patented respiration meter measures the breathing speed of fresh products within four hours, allowing companies to respond to seasonal variations in respiration. The device measures the respiration speed (oxygen usage and CO₂ production). These details are converted into the necessary transmission for each packaging.

The camera checks every micro-perforation according to diameter and shape. This is not only a measure of quality but also a means to measure the oxygen permeation of the perforated packaging. If necessary the laser can be adjusted automatically to capture the variations in thickness of aluminium. According to PerfoTec their laser is the only one in the world that has this capacity with its patented closed-loop-feedback-camera system.

The laser system is installed directly onto the packaging machine. According to De Bruin, they have not yet encountered a machine to which the laser system could

‘This respiration control is vital’

not be fitted. “We always maintain contact with the supplier of the packaging machines. Occasionally they will tell clients about us when they purchase a machine.” The PER30 laser is available for an estimated cost of € 49.500. The respiration meter is estimated to cost around €13.000.

Uncomplicated for the client

PerfoTec strives to ensure that the system is relatively uncomplicated for the client. First the client measures how fast the different products breathe with the respiration

Liner bags



PerfoTec has developed ‘liner bags’ (crate bags for bulk packaging) that create the ideal atmosphere during transportation from the farm (often abroad) to the vegetable processor. In order to use this packaging the grower or wholesaler needs equipment to measure the respiration speed. With these details PerfoTec can supply perforated crate bags. These liner bags are also suitable for temporary storage of products so the client has more flexibility when it comes to fluctuations in supply and demand.

control. Then the client uses these measurements to determine how many perforations and what size they need to be, with PerfoTec available to assist. These details are programmed into the system. An operator can choose a programme dependent on the product to be packaged. PerfoTec

employees can monitor laser systems worldwide, via a remote support programme, when there are any disruptions.

Film converters can micro-perforate but there are safety margins surrounding that, explains De Bruin.

“Our clients, producers of fresh fruit and vegetables, know their product better than filmconverters. We provide our clients with the opportunity to fine tune the packaging which prolongs its shelf life by a few extra days.”

• DIONNE IRVING •

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