

**FOR IMPROVED FRESHNESS,
HEALTHIER & SAFER FOOD,
INCREASED LOGISTIC
FLEXIBILITY AND REDUCED
(FOOD) WASTE**



ACTIVE PACKAGING



A NEW PACKAGING STRATEGY

Traditional packaging materials such as plastics, glass and cardboard are designed to be as inert as possible. Modern packaging strategies however, seek to promote an additional active role to assist in maintaining the product's quality. Such packaging concepts are called Active Packaging. They are deliberately made to contain substances that interact with the atmosphere inside the packaging or the packaged product.

This leaflet will explain the different types of active packaging and how you can benefit from them.

DIFFERENT TYPES OF ACTIVE PACKAGING

All active packaging concepts have one thing in common: they interact with the packaged product and/or the atmosphere inside the packaging in order to prevent quality loss and prolong shelf life. Depending on the type of product, however, quality loss may be caused by different factors. Thus, different types of active packaging are required to achieve the desired effects in each specific situation.

SCAVENGERS, EMITTERS AND ADAPTORS

Many specific active packaging solutions exist, but a general distinction can be made between three types.

Scavengers: solutions that absorb substances from the packaging's inner atmosphere (for example: oxygen, moisture, ethylene);

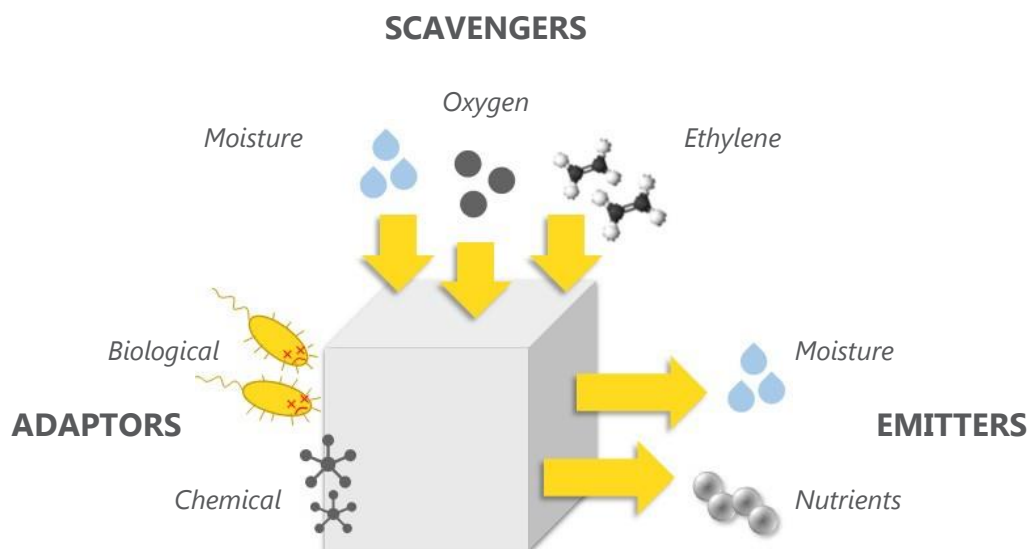
Emitters: solutions that release substances into the packaging (for example: CO₂, antioxidants);

Adaptors: solutions that do not absorb or release substances but cause desirable chemical or biological changes in the packed product and/or in the microbial life present in the packed product or the packaging's inner atmosphere (e.g. to reduce respiration or growth of microorganisms).

AN ACTIVE PACKAGING SOLUTION FOR EACH SITUATION

Depending on the type of product, packaging type and/or use situation, different active packaging systems may be used to achieve one or more of the benefits that active packaging can offer (see also the last page of this leaflet).

The most widely used active food packaging technologies seek to control oxygen, moisture, temperature, salts, sugar, acids and CO₂ inside the packaging and/or packaged product.

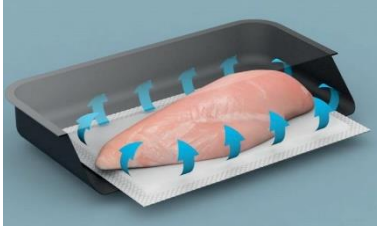


Want to learn
more about
Active Packaging?



COMMERCIAL EXAMPLES OF ACTIVE PACKAGING SOLUTIONS

Active packaging is not just future talk; it's also very much of the moment. While you might not realize it, several types of active packaging technologies can already be found in supermarkets nowadays. Some examples are shown and described below.



"CELLCOMB" PADS

These closed food pads from *Cellcomb* absorb excessive liquids and moisture and gradually release carbon dioxide (CO₂) in the food packaging. Thereby, the gas composition in the packaging is maintained and the bacterial growth decreased resulting in prolonged shelf-life. Different products require the use of different pads.



"DRI-FRESH FRESH HOLD" PADS

These moisture-absorbing pads from *Sirane* may include one or more additional active features, depending on the application. For fruits, for example, antifungal and/or ethylene-scavenging functionalities may be added. In this way, the pads can maintain quality longer and increase food safety for various types of fresh foods.



"RYOCOAT" & "EMULACTIV" COATINGS

These anti-oxidant and antimicrobial coatings for paper and board by *REPSOL YPF Lubricantes & Especialidades* slowly release volatile natural extracts with antifungal and anti-oxidant effects into the packaging, thereby preventing spoilage of fresh produce during B2B-transport.



"FLOWER TRANSPORT GEL"

This gel developed by *FlowerCare Holland* supplies flowers with moisture and nutrients during transport and contains active components that prevent the growth and spread of moulds such as Botrytis. This way, the gel helps to keep flowers fresh and extend vase-life.



BiOn® ETHYL STOPPER

These sachets from *Bioconservación* help maintain the quality of fresh fruit, vegetables and cut flowers by removing ethylene from the air around the produce, thereby slowing down the ripening process and extending shelf-life.



AGELESS® OXYGEN SCAVENGERS

These oxygen-absorbing sachets from *Mitsubishi Gas Chemical* can be used for various applications including foods, textiles and electronics. Because they keep oxygen levels below 0,1 vol. %, they ward off pests and prevent oxidation of oils/fats, colour changes and microbial proliferation and ward off pests, resulting in improved product quality and an extended shelf-life.

ACTIVE PACKAGING IN SHORT

ADVANTAGES*

- » Provide optimum conservation of foods & other perishable goods
- » Extend product shelf life
- » Maintain product quality throughout the value chain
- » Maintain food safety throughout the value chain
- » Reduce product & packaging waste throughout the value chain
- » Reduce logistics costs by offering products with a longer use-by date and hence lower turnover
- » Make products more appealing to customers & consumers

OPPORTUNITIES*

- » Reduced risk of foodborne illnesses
- » Better nutritional and sensorial qualities of foods
- » More natural foods with lower amounts of preservatives and (artificial) additives
- » Reduced product & packaging waste
- » Increased flexibility in logistic systems
- » Increased overall efficiency of the value chain

CHALLENGES

- » No 'one size fits all' solution; adaptation of active packaging technology to each specific application is required
- » Improper use may have adverse effects
- » Availability of active packaging solutions (except oxygen scavengers)
- » Minimum required order size is often high
- » Communication of benefits towards consumers and value chain stakeholders

**: Whether or not a specific active packaging technology is able to deliver certain effects or opportunities is dependent on many factors, including the composition of the active material, the product it is used on and environmental factors. We recommend to always contact the producer of the active material to learn whether or not it is suitable for your application and which effects can be achieved.*

ABOUT ACTINPAK

COST FP1405 ActInPak aims to identify and overcome the key technical, social, economic and legislative barriers to a successful deployment of renewable fibre-based functional packaging solutions such as active and intelligent packaging. Currently, 43 countries are involved in the network, with participants representing 209 academic institutions, 35 technical centers, and 83 industrial partners. For more information, please visit the ActInPak website: www.actinpak.eu

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation. www.cost.eu



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