

Gas Packaging for Fruits and Vegetables.



Consumers demand high-quality fresh fruit and vegetables all year round. This is both an opportunity and a challenge to producers, processors, and packers. Careful handling supports hygiene and product integrity throughout the supply chain – from harvesting, through storage, preparation, packaging, and distribution. It promotes product quality and longer shelf life.

For growers and food producers, the solution to meet these demands for high quality lies in new highly-sophisticated, efficient production and packaging processes that guarantee taste, appearance, food safety, and value.

The challenges

The right choice of modified atmosphere in the right packaging material is essential in extending shelf life and mitigating the factors leading to spoil.

If fruits and vegetables are sealed with a film that has insufficient permeability, undesirable anaerobic conditions (less than 1% oxygen and more than 20% carbon dioxide) will lead to loss of quality. Conversely, if they are sealed in a film which has excessive permeability, little or no modified atmosphere will be retained.

Another risk is moisture loss, which can accelerate the deterioration process. It is crucial to achieve the right balance between a product's respiration rate and the transmission of oxygen and carbon dioxide through the packaging medium. An equilibrium modified atmosphere (EMA) is determined through rigorous testing and is influenced by the following:

- Respiration rate
- Pack volume
- Food types and ingredients
- Maturity and intensity of produce preparation
- Temperature
- Packaging material
- Fill weight
- Light permeability

The solution

Atmospheric control combined with the right packaging is proven to extend the lifespan of fresh produce. Micro porous film is a good example of fit-for-purpose Modified Atmosphere Packaging (MAP). It has the right level of permeability to retain freshness and lengthen the shelf life. It also offers the correct intermediary permeability and supports the establishment of a desirable EMA. Typically, EMAs of 3 – 10% oxygen and 3 – 10% carbon dioxide significantly increase the shelf life of fruit and vegetables. However, determining the optimum EMA for a particular fruit or vegetable is a complex issue that can only be solved with practical testing.

The Messer solution

Messer’s Modified Atmosphere Packaging brings you a full range of tailored solutions to meet the packaging requirements of the food industries. Our Messer specialists will recommend the most suitable gas, equipment, and safety products for your process, site, and employees.

The Messer’s Modified Atmosphere Packaging gas range has been created to match the special quality requirements of the food industry. They comply with the

strict food standards and legislation regarding packaging, storage, and distribution. We can provide the traceability and safety guarantees demanded by the law.

Messer’s dedicated field and in-house specialists have in-depth knowledge of the options available to you. We will work with you to develop the right gas mixture for the products being packed.

Gases:

- Oxygen
- Nitrogen
- Carbon Dioxide

Technical service

Messer works closely with the food industry to create and develop leading technologies and applications. Across Messer, we have dedicated MAP technical specialists in place to support and aid all our customers. They can advise you on a range of topics, including gas mixture selection, achievable shelf life, and analysis techniques.

Recommended gas mixtures for fruits and vegetables

Product	Gas mixtures	Gas volume Product volume	Typical shelf-life		Storage temp.
			Air	MAP	
Lettuce	5% O ₂ + 5 – 20% CO ₂ + 75 – 90% N ₂	0.01 - 0.02 SCF/lb	2 – 5 days	5 – 8 days	36 – 39°F
Fresh cut salad mix	5% O ₂ + 5 – 20% CO ₂ + 75 – 90% N ₂	0.01 - 0.02 SCF/lb	2 – 5 days	5 – 8 days	36 – 39°F
Pre-peeled potatoes	40 – 60% CO ₂ + 40 – 60% N ₂	0.01 - 0.02 SCF/lb	< 5 hours	10 days	36 – 39°F



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