



Fish & seafood. MAPAX®

The focus on healthy eating is accelerating demand for fish and seafood. The challenge facing the industry is to ensure that these delicate products maintain the highest quality from the hatchery to the plate. Food processors must ensure that the final product, whether frozen, chilled or packed in a modified atmosphere, retains its original freshness. This is complicated by a high water and fat content, a neutral pH and enzymes, all of which can rapidly spoil.

The solution to preserving product quality lies in new ways of working – in highly sophisticated, efficient production and packaging processes that guarantee taste, appearance, food safety and value for money.

The challenge

Fresh fish deteriorates very quickly. Its high water content, neutral pH (at which micro-organisms thrive) combines with the presence of enzymes to encourage microbial growth and spoil. This makes for bad taste and smell. Naturally occurring micro-organisms also break down fish proteins compounding the problem. Herring and trout can turn rancid even before microbial deterioration is detectable while the oxidation of unsaturated fats in high-fat fish such as tuna, herring and mackerel is another risk.



The solution

In order to maintain the high quality of fresh fish products, it is vital to keep temperatures as close to 0°C as possible.

With the right gas mixture, shelf life can be extended by a few days. For example, Modified Atmosphere Packaging (MAP) is proven to extend the shelf life of cod, flounder, plaice, haddock and whiting. At 0°C, it enables it to be stored for twice as long as in air.

Depending on the storage temperature (0 – 2°C), MAP can prolong shelf life by three to five days compared with that of raw fish in a covered tray.

Carbon dioxide is essential to quality. It inhibits the growth of common aerobic bacteria. A carbon dioxide level of at least 20% will reduce the pH value of the tissue surface and consequently, slow bacterial growth. In practice, however, it is not unusual to find carbon dioxide levels of 50%. But beware, excessive concentrations of carbon dioxide can produce undesirable side-effects such as loss of tissue liquid and, in the case of crabs, a sour taste.

Oxygen, as a component of a modified atmosphere, will stop colour change and fade. It also prevents the growth of anaerobic micro-organisms. Nitrogen is better suited to preserving the quality of high-fat fish.

The BOC solution: MAPAX®

MAPAX® brings you a full range of tailored solutions to meet the packaging requirements of the food industries. Our BOC specialists will recommend the most suitable gas, equipment and safety products for your process, site and employees.

The MAPAX® 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.

Food grade gases

BOC'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

Recommended gas mixtures for fish and seafood

Product	Gas mixture	Gas volume Product volume	Typical shelf-life		Storage temp.
			Air	MAP	
Raw fish	40 – 90 % CO ₂ + 10% O ₂ + 0 – 50 % N ₂	200 – 300 ml 100 g fish	3 – 5 days	5 – 14 days	0 – 2°C
Smoked fish	40 – 60% CO ₂ + 40 – 60% N ₂	50 – 100 ml 100 g fish	15 days	30 days	0 – 3°C
Cooked fish	30% CO ₂ + 70% N ₂	50 – 100 ml 100 g fish	7 days	30 days	0 – 3°C
Prawns (peeled, cooked)	40% CO ₂ + 60% N ₂	50 – 100 ml 100 g prod	7 days	21 days	4 – 6°C

Technical services

BOC works closely with the food industry to create and develop leading technologies and applications. Our Food Technology Centre in Thame, Oxfordshire welcomes customers for trials and product testing. Across BOC and our parent company The Linde Group, 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.

Contact us

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BOC has the leading range of products and services for many areas of food processing, including chilling, freezing and MAP. These are supported by a team of dedicated field and in-house specialists as well as our UK Food Technology Centre.

BOC

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