MESSER
Gases for Life

Gas Packaging for Fish and Seafood.

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 contribute to rapid spoil.

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

The challenges

Fresh fish deteriorates very quickly. Its high water content and neutral pH combine with the presence of enzymes to provide a thriving environment for microbial growth which leads to decreased quality and spoil. Naturally occurring micro-organisms also break down fish proteins, thus compounding the problem. Herring and trout can turn rancid even before microbial deterioration is detectable while the oxidation of unsaturated fats provide another risk in high-fat fish such as tuna and mackerel.

The solution

In order to maintain the high quality of fresh fish products, it is vital to keep temperatures as close to 32°F as possible.

Utilizing Modified Atmosphere Packaging (MAP) and the right gas mixture can extend the shelf life by at least a few days and possibly up to two weeks in raw packaged fish such as cod, flounder, plaice, haddock, and whiting compared to packaging in traditional atmospheres similar to that of air.

Carbon dioxide is also essential to quality, as 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. On the other hand, 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 the fade or change in color. It also prevents the growth of anaerobic micro-organisms. On the other hand, preserving the quality of seafood products with high fat content is better suited with the use of nitrogen.

The Messer solution

Messer's Modified Atmoshere 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.

Messer's Modified Atmoshere 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.

Food grade gases

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.

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 fish and seafood

Product	Gas mixtures	Gas volume Product volume	Typical shelf-life Air	 MAP	Storage temp.
Raw fish	40 – 90 % CO_2 + 10% O_2 + 0 – 50 % N_2	0.04 - 0.06 SCF/lb	3 – 5 days	5 – 14 days	32 - 36°F
Smoked fish	40 – 60% CO_2 + 40 – 60% N_2	0.01 - 0.02 SCF/lb	15 days	30 days	32 - 37°F
Cooked fish	30% CO_2 + 70% N_2	0.01 - 0.02 SCF/lb	7 days	30 days	32 - 36°F
Prawns (peeled, cooked)	40% CO_2 + 60% N_{22}	0.01 - 0.02 SCF/lb	7 days	21 days	39 - 43°F

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