

## FAQ's. MAPAX®

### Food

#### **How long can a Modified Atmosphere Packaging (MAP) system extend shelf life?**

That depends on many factors. Product type, temperature, hygiene, packaging and gas mixture all influence shelf life. With the right mix, it can be increased by days – even weeks. For more information, please see the MAPAX market sector quick guides.

#### **Can I freeze a product which is packed in a modified atmosphere?**

You can, but as it thaws, the product will lose liquid. This will cause it to look unappetising if it remains in the sealed package. You should also ensure that the packaging material is suitable for freezing.

#### **There is a white substance on the sausage that easily comes off. What is it?**

This white substance is made up of calcium compounds or salt (not table salt). It comes from the product as a result of its high residual oxygen level. By controlling the residual oxygen, it can be reduced or eliminated.

#### **There are some pale grey (almost white) spots on the smoked sausage. The sausage has been rinsed, cooled in a cryogenic freezer and then packed in MAP. How can I prevent this?**

There may be a number of reasons for these spots. It could be down to a localised low temperature area arising during the cooling process prior to slicing. Cryogenic freezing can also cause bleaching. Contact your application engineer to check the freezer. Adjusting the process may stop this.

#### **Which gas or gas mixture can I use to prevent a greenish tinge on the ham I produce?**

This colouring is caused by bacteria which grow naturally during processing. No gas or gas mixture can change this.

#### **The meat I pack under MAP loses its colour, but the colour reappears after I open the package. Am I using the right gas mixture?**

The myoglobin molecule which is responsible for the colour of meat and meat products, turns different colours with different gas mixes. For recommendations on the right gas mixture for your product, please see the MAPAX® Meat and Poultry quick guide.

#### **The sliced meat we pack under MAP turns grey. Sometimes there are different-coloured spots on the meat. Could this be caused by a wrongly-filled gas cylinder, or is it a common problem with any gas mixture?**

The gases and mixtures in the BOC Food Fresh cylinder range are controlled constantly and the wrong labelling or filling of a cylinder is almost impossible. The grey spots could be the result of a number

of factors. For example, the packaging film's UV filter may have been changed and no longer match the light exposure; the additive mix could have changed or the production process altered. Even raw ingredients like water and meat can vary. It could be that the optimum gas mixture is not being used; there is an excessive residual oxygen level in the package; or condensation (water that has been released from the food product and condensed within the pack) has fallen from the lid. Consult your BOC sales and technical specialist for advice.

#### **When I open the food pack, there is a smell. Why is this?**

Each product generates its own odour which is made up of the many volatile compounds that collect in the headspace of the package. Wait for a minute after opening: if the smell has not gone away, check the quality.

#### **Which gas or gas mixture should be used to ripen meat?**

Meat can be ripened in mixtures of carbon dioxide (CO<sub>2</sub>) and nitrogen (N<sub>2</sub>). The exact mixture depends on the type of meat and how it is sliced.

### Gas

#### **Which gas mixture should I use?**

This depends on the type of food product, the shelf life you want and the target market. For specific information, refer to the MAPAX brochure and your local BOC sales and technical representatives. Tests may be needed to decide the optimum mixture.

#### **I am just starting out with MAP. What equipment do I need?**

Most processes require a regulator, a flow meter and a selection of pipes and tubing at the very least. Start with Food Fresh premixed single cylinders. Your local BOC sales and technical specialist can advise on the right selection and set-up for your MAP equipment.

#### **Is it better to purchase pre-mixed cylinders or to buy individual gases and mix them on site?**

This depends on the volume and the type of production. If the volumes are large or your plant produces different products with different gas requirements, it could be better to mix on site.

#### **Where should I place the cylinders I am using?**

Ideally you want them out of the processing area for quality and hygiene reasons. Please refer to your local regulations.

#### **What gas pressure do I need?**

This depends on the type of machine and the type of product. Consult your machine manufacturer as well as your local BOC sales and technical representatives.

**As I use more gas, will cylinders become a more expensive option?**

Yes. As your business grows, so will your gas consumption. Your BOC sales and technical specialist can help you determine when the time is right to switch from cylinders to a bulk tank operation.

**What about employee safety?**

We provide safety training courses and relevant safety data sheets. Each country has its own regulations for the safe use of gas. These must be followed and integrated into your quality assurance systems.

**What precautions should be taken when using high-oxygen gas mixtures?**

Please contact the machine supplier to check whether the machine is suitable for high-oxygen gas mixtures.

**What do the different gases do?**

Carbon dioxide delays the growth of micro-organisms by dissolving into the food. Nitrogen is used to replace oxygen and thereby slow deterioration. It is also used as a buffer gas. Oxygen is used to maintain the red colour of meat and to allow respiration in fruit and vegetables. The gas mix is usually tailored to suit different product needs.

**Why should I use food grade gases?**

Industrial gases do not satisfy legal requirements relating to the quality, labelling and handling of gases as additives. Food grade gases do.

## Packaging

**Does the packaging have to be labelled with the words 'MAP packaged'?**

That depends on local country regulations. In the EU, if the durability of a food has been extended by being packaged in a permitted packaging gas, it must carry the words 'packed in a protective atmosphere'.

**What head space (gas volume) is used in the package?**

That depends on the food product and type of package. For example the gas volume/product volume ratio lies between 0.5 for sausages and 2.0 for fish.

**I get condensation in my packs. What is wrong?**

The most likely reason is the difference between the product temperature and the storage temperature. Packaged product visibility can be improved by using anti-fogging films. The product should always have the lowest possible temperature at the moment of packing and be kept at the same temperature or lower during storage. Condensation could also occur if the package is punctured. Also check the residual oxygen level.

**The packages blow up over time. Is the product fermenting?**

This is nearly always due to carbon dioxide generated by the product. It can be caused by the temperature being too high (>4°C) over a period and cannot be reversed by cooling the product. Some foodstuffs, such as hard cheeses, develop carbon dioxide through natural fermentation. This process can continue after packing and cause 'blow-up'. Contamination can also lead to the development of unwanted gases and package expansion. Check immediately with your food lab.

**Why do MAP packages collapse?**

This is a normal occurrence with high water content products. Carbon dioxide in MAP mixtures dissolve easily in the water and fat phases of products kept at low temperatures. The amount of carbon dioxide in the headspace decreases and creates a small degree of 'under pressure' inside the package.

**How do I know that I have the right gas volume and mixture in the package?**

There are several types of gas analysers on the market. They are easy to use and give quite accurate answers on mixture and residual oxygen levels. It is important to establish best practice monitoring regimes in order to avoid large amounts of produce being packed incorrectly. Your BOC sales and technical specialist will help you to choose the equipment best suited to your needs.

**Why does the residual oxygen level in the package increase over time?**

There are several reasons why this may happen. There could be a leak in the package or the oxygen barrier may not be high enough. Moreover, air (containing 21% oxygen) may have been trapped within the product during packaging (cakes and bread for example). That said, the most common reason is a leak in the seal.

**How much residual oxygen is recommended in the package?**

This depends very much on the product. Consult your BOC sales and technical specialist.

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