

# Modified atmosphere packaging (MAP)

With the adjustment of gases, food stays appetizing longer



## Benefits:

- Extended shelf life
- Appetizing appearance
- Increased flexibility of packing and distribution

# N<sub>2</sub>, CO<sub>2</sub> and O<sub>2</sub> – The Ideal Gases for Modified Atmosphere Packaging

When packed in air food is susceptible to three main spoilage mechanisms; simple oxidation, bacterial growth and mould growth. However, all of these can be suppressed or reduced by packaging the food in the appropriate Modified atmosphere. The gases used for modified Atmosphere Packaging (MAP) are carbon dioxide, oxygen and nitrogen – all of which are naturally present in air.



The main effects of these gases are:

### Carbon dioxide

actively retards the growth of both bacteria and moulds

### Oxygen

maintains red colour of meat and inhibits anaerobic bacteria

### Nitrogen

essentially inert

### Food gases approved by the EC

E-no.	Gas	Name
E 290	Carbon dioxide	Gourmet C
E 938	Argon	Gourmet A
E 939	Helium	Gourmet He
E 941	Nitrogen	Gourmet N
E 942	Nitrous oxide	Gourmet L
E 948	Oxygen	Gourmet O
E 949	Hydrogen	Gourmet H
E941/E290	70% Nitrogen, 30% Carbon dioxide	Gourmet N70
E941/E290	50% Nitrogen, 50% Carbon dioxide	Gourmet N50
E948/E290	70% Oxygen, 30% Carbon dioxide	Gourmet O70

### Application Examples

Product	% CO <sub>2</sub>	% N <sub>2</sub>	% O <sub>2</sub>
Red Meat	20-35		80-65
Poultry	25-100	75-0	80-0
Fish	30-60	70-40	30-0
Cooked/Cured meat	30-70	70-30	
Bakery Product	50-100	50-0	
Cheese	30-100	70-0	
Pizza	40-60		
Fresh Pasta	40-80	60-20	
Coffee/Crips/Nuts		100	

Generally, MAP aims to eliminate or reduce oxygen (except for special cases such as packing red meat, or to prevent anaerobic growth) and to increase CO<sub>2</sub> to 20% or above to inhibit bacteria and moulds. Where necessary, the balance of the modified atmosphere is made up with nitrogen, e.g. if carbon dioxide tends to dissolve in the product causing package collapse.

MAP therefore, normally requires a mixture of at least two gases, and the optimum proportions vary from product to product. Messer can offer you advice and assistance in establishing your gas requirements. MAP gases can be supplied pre-mixed in cylinders or mixed on site from cylinders or bulk tanks of individual gases.



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