Active packaging
Active packaging employs a packaging material that interacts with the internal gas environment to extend the shelf-life of food. Such technologies continuously modify the gas environment (and may interact with the surface of the food) by removing gases from or adding gases to the headspace inside a package. Examples of active packaging systems are oxygen scavenging, carbon dioxide production, water vapour removal, ethylene removal and ethanol release.

Aerobic organism
An organism that normally grows in the presence of air (20% oxygen).

Anaerobic organism
An organism that normally grows in the absence of air (20% oxygen) or oxygen. Anaerobes can be “strict” (obligate) anaerobes, i.e. they can be killed by oxygen, or “facultative” anaerobes, i.e. they can grow under either aerobic or anaerobic conditions.

Anti-fogging properties
Film manufacturers produce a high surface tension film with hydrophilic properties that allows moisture to wet the surface in order to avoid fogging.

Argon
Ar is an inert gas with low solubility in water. Air contains approximately 1% argon.

Bacteriostatic effect
Capable of inhibiting bacterial growth without killing microorganisms.

Biochemical process
Process or phenomenon in a living organism or biological system described in chemical terms.

BIOGON®
BIOGON® is the trademark for food-grade gases from Linde available in certain countries.

CA
Controlled atmosphere.

Campylobacter
A genus of microaerophilic bacteria, some forms of which can cause serious health issues.

Carbon dioxide
CO₂ has a slightly acidic odour. It dissolves easily in water and thereby inhibits the growth of many microorganisms. Air contains approximately 0.03% carbon dioxide.

Catalyst
A substance that regulates the rate of a chemical reaction and itself remains unchanged.

Clostridium
A genus of bacteria classified as gram-positive rods, anaerobic endospore formers with a fermentative mode of metabolism.

Controlled atmosphere
The atmosphere surrounding food is changed and then controlled during storage.

CFU
Colony-forming units are used to measure the number of microorganisms.

EMA
Equilibrium Modified Atmosphere.

Enzymatic reaction
Chemical reactions catalysed by enzymes.
Enzyme
Globular protein that is the catalyst of a biological system.

ERH
Equilibrium Relative Humidity.

Fermentation
Anaerobic energy-yielding metabolism of cells.

Gas flushing
Flushing with gas or gas mixture to establish a modified atmosphere.

HACCP
Hazard Analysis and Critical Control Point.
A systematic approach to the identification, evaluation and control of food safety hazards.

Inert gas
A gas that does not react with other substances under normal temperatures and pressures.

Lactic acid bacteria
Gram-positive bacteria, usually non-motile, non-sporulating bacteria that produce lactic acid as a major or sole product of fermentative metabolisms. All rod-shaped lactic acid bacteria are placed in one genus called Lactobacillus.

Leak detection
Quality assurance method to check whether food packages have leaks.

Listeria
Facultatively anaerobic bacteria causing serious human disease.

MAP
Modified Atmosphere Packaging. This means altering the composition of the atmosphere inside a package so that it differs from that of normal air.

MAPAX®
MAPAX® is a tailor-made MAP solution developed and delivered by Linde based on data about food, gases and packaging.

MAPAX LD
In-line leak detection system from Linde.

Master-pack
Consumer packages (over-wraps) are packed in a big flexible pack that is gas-flushed.

Membrane
A membrane consists of numerous layers of very thin polymer film, bundled into fibres. It is used to produce nitrogen on site by exploiting the variations in velocity at which different gas molecules pass through polymer materials.

Mesophilic bacteria
Organisms living in the temperature range around that of warm-blooded animals. This means those that grow well between 20°C and 45°C.

Microorganism
All microscopic forms of life, which includes such forms as bacteria, fungi, viruses, protozoa and algae.

Modified atmosphere
An atmosphere differing from that of normal air. Normally the oxygen content is reduced and the carbon dioxide content is increased.

Mould
Aerobic food-spoilage microorganisms. They tolerate low water activity and a low pH value.

Myoglobin
The principal pigment in fresh meat. The form it takes is of prime importance in determining the colour of the meat.
Nitrogen
N₂ is an inert gas with low solubility in water. Air contains approximately 78% nitrogen.

Nitrous oxide
N₂O dissolves easily in liquid. It is mainly used for whipping cream.

Nutritional content
Expresses the nutritional content, e.g. carbohydrates, fats, proteins and vitamins.

Oxidation
Chemical reaction with oxygen resulting in unwanted changes, e.g. rancidity and vitamin loss.

Oxygen
O₂ is a very reactive gas with low solubility in water. Air contains approximately 21% oxygen.

pH value
Expresses acidity (pH 0–6), neutrality (pH 7) and alkalinity (pH 8–14).

PSA
Pressure swing adsorption. This technology is used to produce nitrogen on site. It is based on the ability of activated carbon to capture and retain oxygen from the air under certain conditions, while allowing nitrogen to pass through.

Protein
Macromolecules built up of amino acids with peptide bonds.

Psychrophilic bacteria
These bacteria are able to grow at low temperatures, i.e. 0°C to 5°C.

Rancidity
Oxidation of lipids.

Respiration
Aerobic energy-yielding metabolism of cells.

Shelf-life
The period between packaging a product and its use, during which the quality of the product remains acceptable to the consumer.

Shelf-life technology
The methods for enhancing shelf-life.

Sous-vide
The sous-vide technique entails packaging a food product in a vacuum, then preparing it at high temperature (70 to 80°C), and quickly chilling it down to 2 to 4°C.

Thermophilic bacteria
Organisms that grow at elevated temperatures, i.e. above 55°C.

Water activity
a_w. The ratio of the water vapour pressure of a material to the vapour pressure of pure water at the same temperature.

Pseudomonas
A genus of an aerobic gram-negative rod-shaped bacteria, ecologically important in soil and water owing to their large capacity to mineralise organic matter.