Controlled atmosphere
for fire prevention

FRUIT CONTROL EQUIPMENTS

MOZZANICA
WORLDWIDE FIRE FIGHTING SOLUTIONS

Oxygen reduction systems
for fire prevention

ORS
OXYGEN REDUCTION SYSTEM

Mozzanica & Mozzanica has introduced a new ecological fire prevention solution based on controlling the atmosphere of the environment to protect, in accordance with UNI EN 16750.

Oxygen reduction technology has already been widely used for decades in controlled atmosphere plants to store food (mainly fruits & vegetables) to avoid oxidation processes, as well as in the preservation of valuable artwork; it now finds its natural place in the firefighting sector too.

An **innovative solution with zero ecological impact**, which is certified according to the highest standards.

It can actually be considered a **preventive solution**, unlike other classic firefighting systems, as it is based on making the atmosphere inert to a **level where combustion cannot occur**, eliminating the possibility of igniting fires thanks to the constant monitoring and control of the ratio between oxygen and nitrogen in the environment to protect.

Controlled atmosphere plants

The oxygen reduction technology was developed by Mozzanica in partnership with **Fruit Control Equipments**, an Italian company who is leader in the production of **controlled atmosphere technology** for food with a wide and **long term know-how**.

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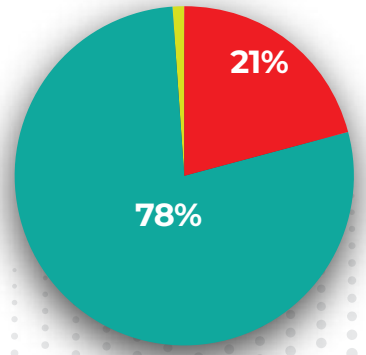
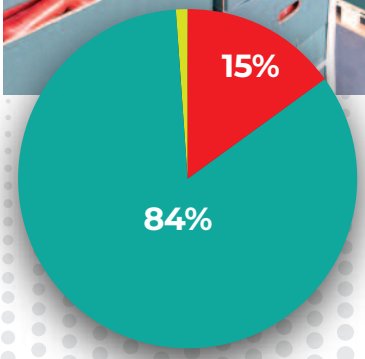
O_2

Oxygen is a gas that makes up 21% of the earth's atmosphere and is the main combustive agent in the combustion process.

N_2

Nitrogen is a gas that makes up 78% of Earth's atmosphere and is inert, colorless, odorless and tasteless.





Atmospheric air

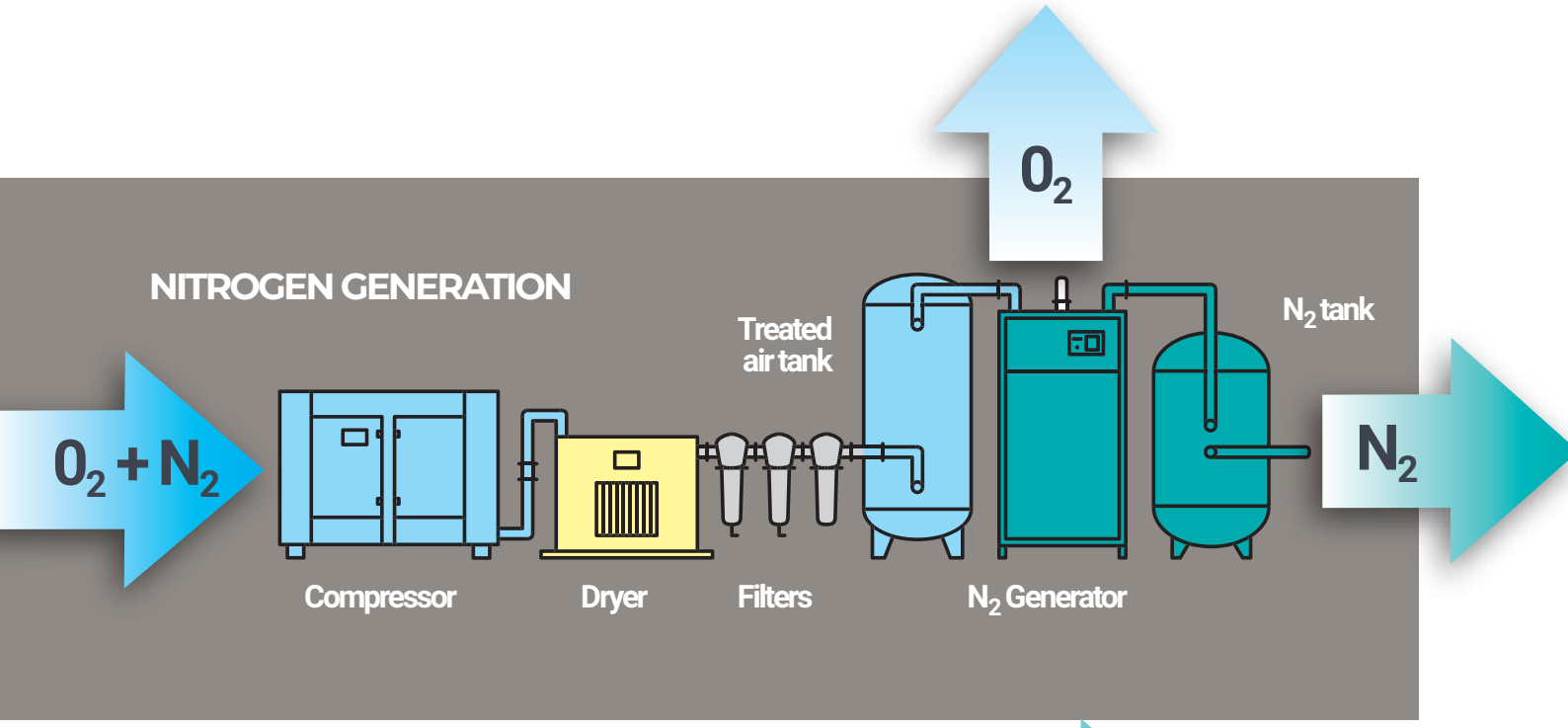
Consisting of a mixture of oxygen (21% O2), nitrogen (78% N2) and other elements in smaller quantities, it can facilitate a combustion reaction due to the presence of oxygen.

Hypoxic air

It consists of a mixture of a higher concentration of nitrogen (84% N2), a reduced quantity of oxygen (15% O2) and other elements in minimal amounts, which inhibit a combustion reaction.

An **ecological solution** from the atmosphere

ORS (Oxygen Reduction System) fire prevention is an economically and advantageous solution because it uses atmospheric air for nitrogen production through a Nitrogen Generator without the needs to be supplied like the chemical

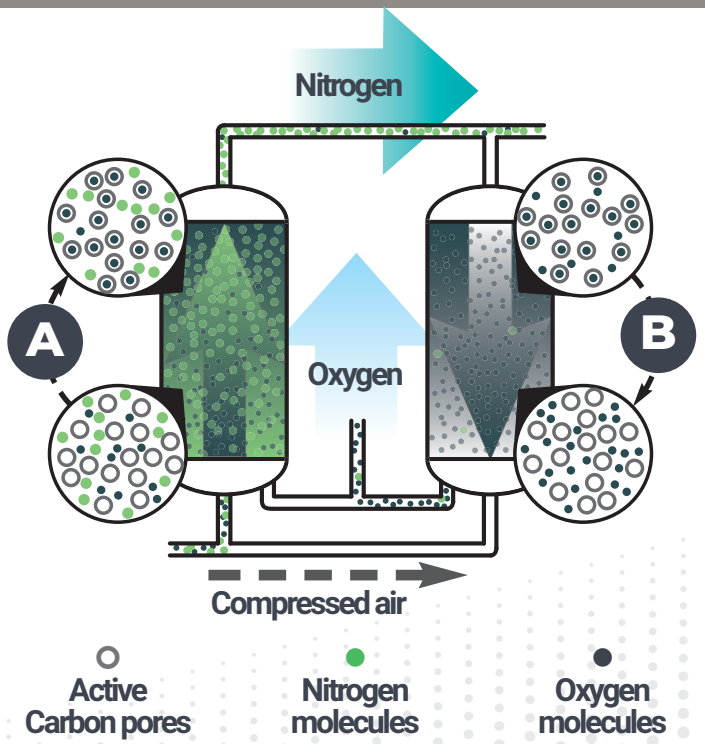


Nitrogen is produced on-site by separating compressed air molecules by consinstency, which are treated and filtered as required through mechanical membrane filters or active carbon that separate oxygen from nitrogen.

Oxygen is returned to the atmosphere, while the **nitrogen produced is stored in gaseous form** to meet the different consumption needs.

A - Absorption: At high pressure, the oxygen molecules, CO2 and aqueous vapor remain trapped in the pores of the active carbon while the larger nitrogen molecules are forced to proceed forward.

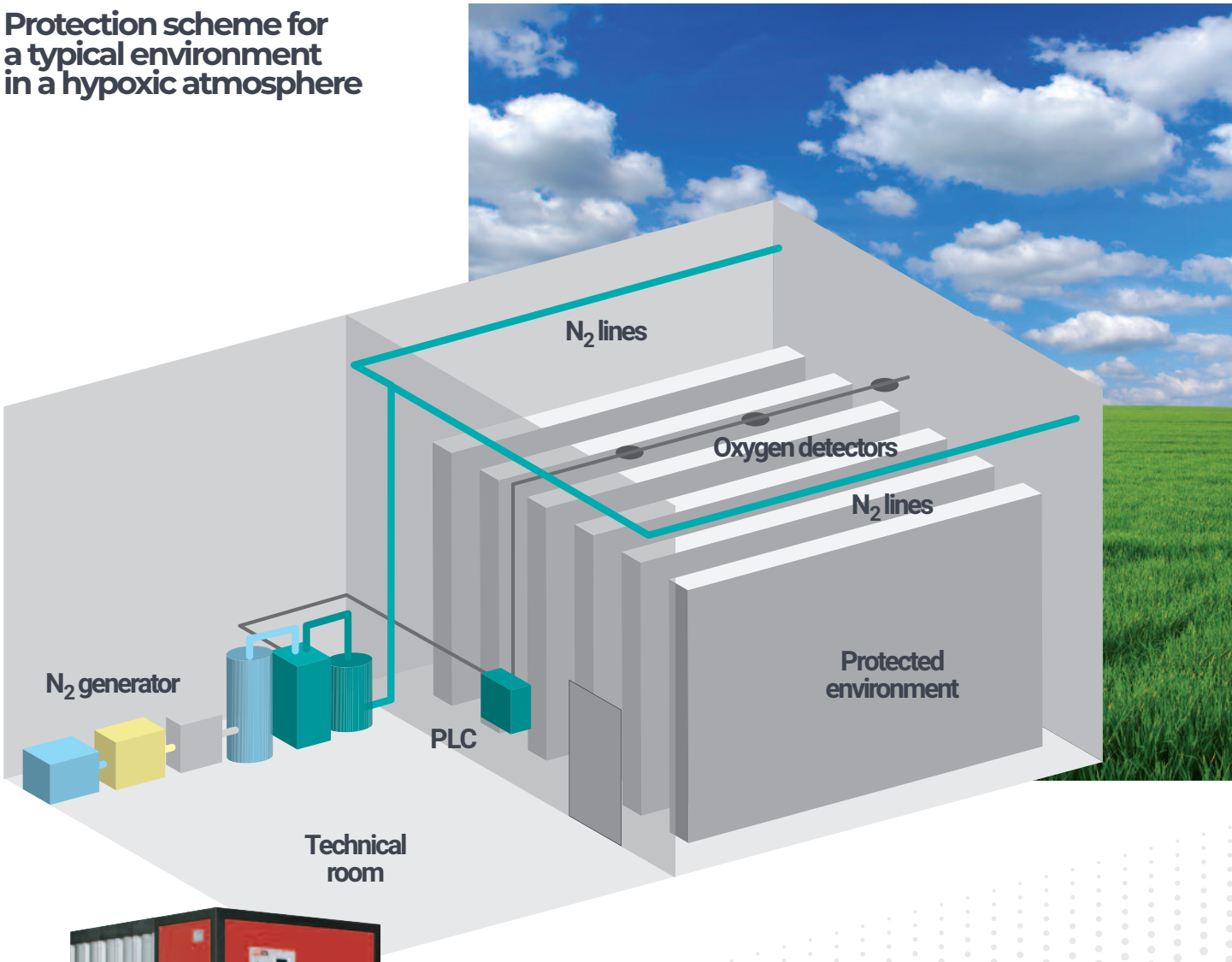
B - Regeneration: The pressure is reduced to the atmospheric level. In this way the release of oxygen molecules occurs, which are eliminated and released into the atmosphere.



The system operates preventatively by **generating a self-extinguishing protective atmosphere** in the environment, consisting of an altered mixture of oxygen + nitrogen that inhibits a fire from igniting.

Furthermore, it is an **ecological solution** that is completely effective and **economically advantageous** because of the ease of installation.

Protection scheme for a typical environment in a hypoxic atmosphere



N_2 generator

The system uses **smoke detectors and oxygen concentration detectors** in the environment that autonomously regulate the production of nitrogen through PLC and release it into the environment to keep a **constant balance between the gases with the right level of hypoxia.**

It is an extremely reliable and safe solution thanks to the **absence of high-pressure cylinders**, with minimal installation and maintenance costs, in **compliance with European regulations** 97/23/CE PED.

Total prevention for **high-risk environments**

The ORS prevention system is characterized by its ability to operate in particularly **high-risk areas** or in highly complex situations, where traditional firefighting systems cannot guarantee a sufficiently high level of safety or are not compatible with the quality standards that the environment to protect requires.

Advantages of ORS technology

- Complete elimination of all fire hazards
- Zero environmental and aesthetic impact
- Simplicity of design and implementation even in complex settings
- Safeguarding of protected material
- Minimal installation footprint
- Continuous system monitoring
- Extremely convenient for large spaces
- No storage of tanks
- On-site production of the inert gas

Main **applications**

- AUTOMATED WAREHOUSES
- INTENSIVE WAREHOUSES
- COLD ROOMS
- DATA CENTERS
- ARCHIVES AND DEPOSITS
- REFRIGERATED WAREHOUSES
- VAULTS
- PHARMACEUTICAL WAREHOUSES

Heritage **protection**

The oxygen reduction system is particularly suitable where technical, architectural or aesthetic constraints do not allow the installation of conventional firefighting systems, or in specific settings where the assets to protect have a very high economic and/or cultural value, such as historical archives and/or museum areas, where other fire protection systems would cause significant damage to the property.

Mozzanica & Mozzanica Srl

Headquarter
23875 Osnago (LC)
Via Martiri della Liberazione, 12
[T] +39 039 2254 700

Milan Local Branch
20081 Abbiategrasso (MI)
Viale G. Sforza, 62
[T] +39 039 2254 700

Porto S. Elpidio Local Branch
63821 Porto Sant'Elpidio (FM)
Via della Calzatura, 6/A
[T] +39 039 2254 700

Mozzanica USA LLC

Headquarter
2253 Vista Parkway, suite 8
West Palm Beach, FL 33411
[T] +1 561 370 3597

Riviera Beach Local Branch
3740 Prospect Avenue
Riviera Beach, FL 33404
[T] +1 561 370 3597

Service points

Los Angeles
lax@mozzanica.eu

Dubai
dxb@mozzanica.eu

Singapore
sin@mozzanica.eu

Sydney
syd@mozzanica.eu

info@mozzanica.eu • www.mozzanica.eu

concept: sgs comunicazione - milano

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