BROCHURE

MEMBRANE SEPARATION

OPPORTUNITY

OPPORTUNITY WORKS IN SOCIAL ENTERPRISE EVERY MONTH:

I BAMBINI DELLE FATE
per l'inclusione sociale

The magic of opportunity is unique; being able to discover it, cultivate it and live it is a source of commitment every day for us of opportunity and so we can end the day in a world a little better than how it began.

Ezio Casagrande - CEO Opportunity

At the heart of every challenge is the opportunity to innovate, improve and grow. At Opportunity, we turn problems into solutions, offering tools of excellence for each of your projects. We provide solutions to nurture the future and turn every obstacle into a springboard to success.

The staff

Your vision is our opportunity to create a better world.

OPPORTUNITY
Ingenium Cura Opera

GLOBAL MARKET

We are a dynamic and flexible company that, thanks to the technological progress of its equipment, is able to compete with the national and international market, offering a **wide range of machines**, both new and reconditioned, for use in the food industry.

But we don't want to stop here... we want to expand all over the world!

BRAZIL
ARGENTINA
CHILE
SPAIN
ITALY
TURKMENISTAN
GEORGIA
GREECE

OUR SECTORS

Our experienced designers develop ideas to adapt the machine park to the customer's specific needs. Opportunity's experience supports its customers, both to increase production and to renovate their plants to a new production philosophy.

35
YEARS OF EXPERIENCE

200
TURNKEY INSTALLATIONS

500
SATISFIED CUSTOMERS

WHAT IS SEPARATION ON MEMBRANE ?

ENVIRONMENTAL SUSTAINABILITY

APPLICATIONS

DIFFERENCES

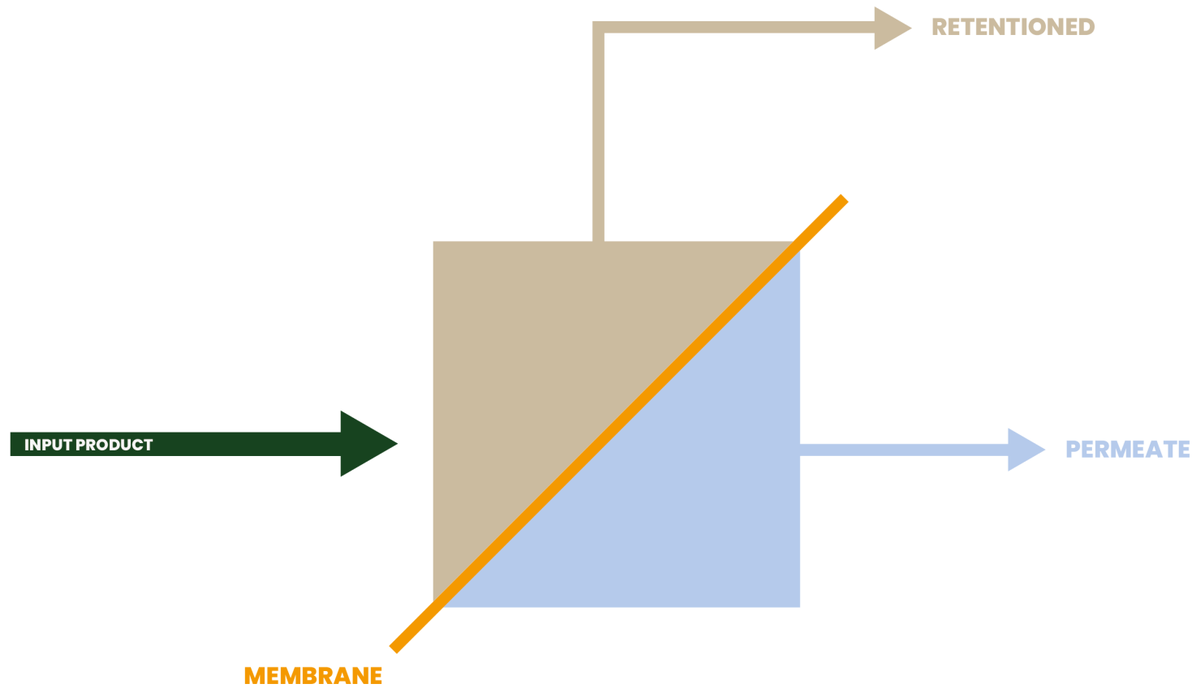
Membrane filtration is a **physical process without additives** that defines the separation of multiple components from a flow of liquids.

Membranes thus play a crucial role in a wide range of industrial sectors and environmental applications.
They find application in the **food and beverage, chemical, pharmaceutical, and energy industries**, where they contribute significantly to the efficiency of separation processes.

This technology is based on the use of **semi-permeable membranes** that can act as a selective barrier.

Membranes are essential in applications **where suspended or dissolved particles need to be separated**.

Their ability to separate components of different molecular weights makes them indispensable tools in situations where turbidity of fluids is essential, unlike nano-filtration and reverse osmosis membranes that are involved in the separation of dissolved molecules.



ENVIRONMENTAL SUSTAINABILITY

The use of membranes **promotes environmental sustainability**, as it helps to reduce the waste of resources and energy required for subsequent treatment processes. Membrane technology continues to evolve, paving the way for new opportunities for more efficient and environmentally friendly applications.

ELIMINATION OF TOXIC WASTE IN THE WINE INDUSTRY

REDUCING THE CHEMICAL DEMAND FOR OXYGEN (COD) IN FOOD INDUSTRY EFFLUENT

APPLICATIONS

- LIQUID CLARIFICATION AND CLARIFICATION
- COLOUR CONCENTRATION
- FERMENTATION RESIDUE RECOVERY
- MOLECULAR SEPARATIONS
- SODA RECOVERY
- WATER PURIFICATION
- PROTEIN CONCENTRATION AND ISOLATION
- REDUCTION IN SALT CONTENT
- PROTEIN STANDARDISATION
- REUSE OF WATER WITHIN THE PLANT
- DRAIN TREATMENT

DIFFERENCES

Tangential and orthogonal (traditional) filtration are **two distinct approaches** to the separation of components from a liquid stream through the use of membranes.

	TANGENTIAL FILTRATION	ORTHOGONAL FILTRATION
FLOW DIRECTION	In this process, the fluid to be treated **flows parallel** to the membrane surface. The liquid part passes through the membrane as permeate, while suspended particles larger than the pore size of the membrane are retained as retentate. The tangential velocity removes the surface deposit from the membrane, creating a self-cleaning effect in the filter.	The flow of liquid passes through the membrane perpendicularly, i.e. in a direction orthogonal to the membrane surface. The product passes through the membrane directly, but the capacity of the filter is limited by the progressive fouling of the filter surface.
SEPARATION EFFICIENCY	**It takes advantage of the self-cleaning** of the membrane surface to allow constant operating modes over time by working both in batch and continuous mode (feed and bleed). The degree of molecular separation depends on the porosity of the membrane; a single pass of tangential filtration achieves the ultimate goal of absolute product clarity. Nanofiltration separates dissolved molecules according to molecular weight, while reverse osmosis only allows water to permeate, guaranteeing the concentration of the retentate product.	The efficiency of orthogonal filtration decreases over time due to increased product deposition on the filter surface. This results in the use of large filter surfaces or discontinuous processes.

CHARACTERISTICS OF THE MEMBRANE PROCESS

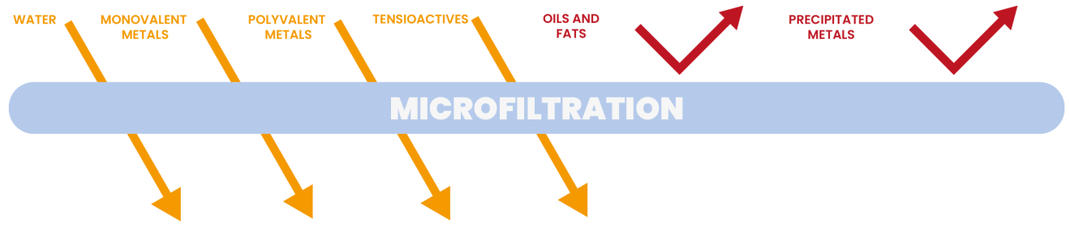
MICROFILTRATION

ULTRAFILTRATION

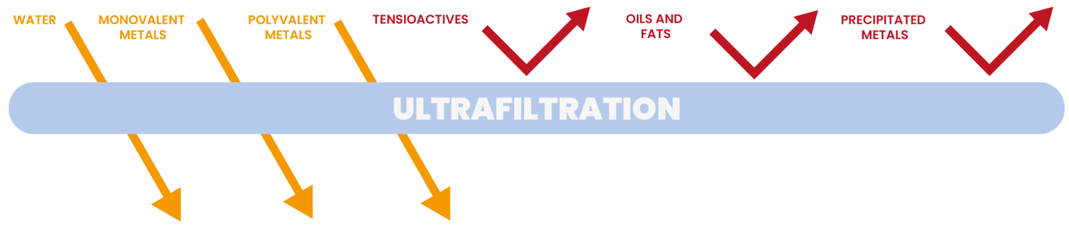
NANOFILTRATION

REVERSE OSMOSIS

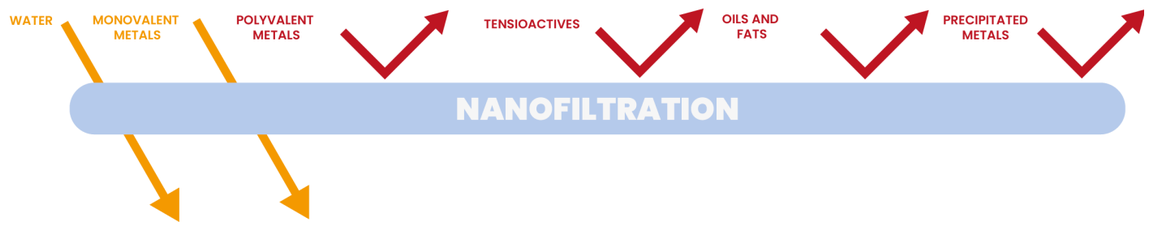
Microfiltration: with wider porosity it retains suspended solids and fine particulate matter, salt precipitates and partially oils and fats.



Ultrafiltration: with pores 10 to 100 times smaller, they even partially retain the active surfactants while allowing salts and water to pass through.



Nanofiltration: only allows monovalent salts to pass together with water

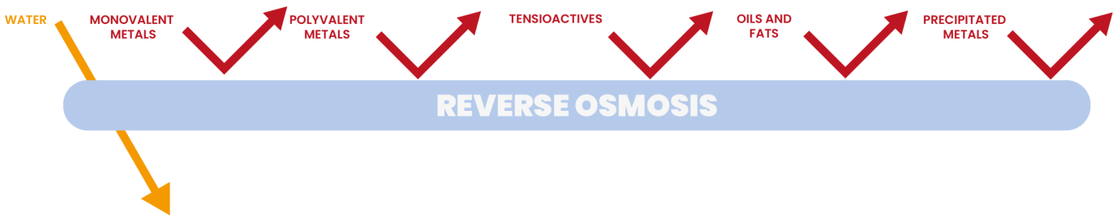


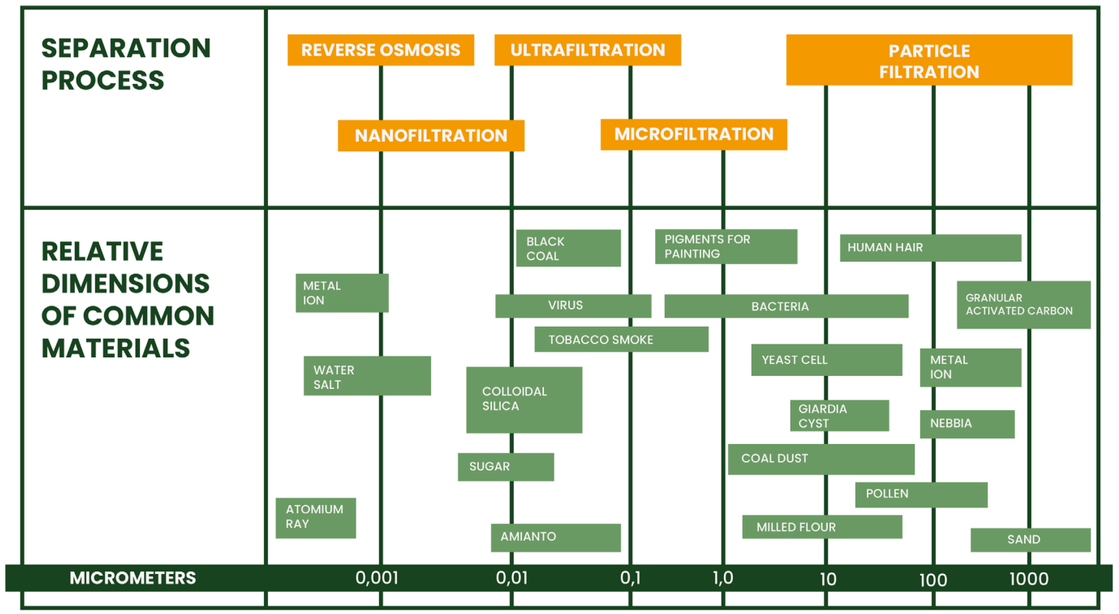
SEPARATION RANGE

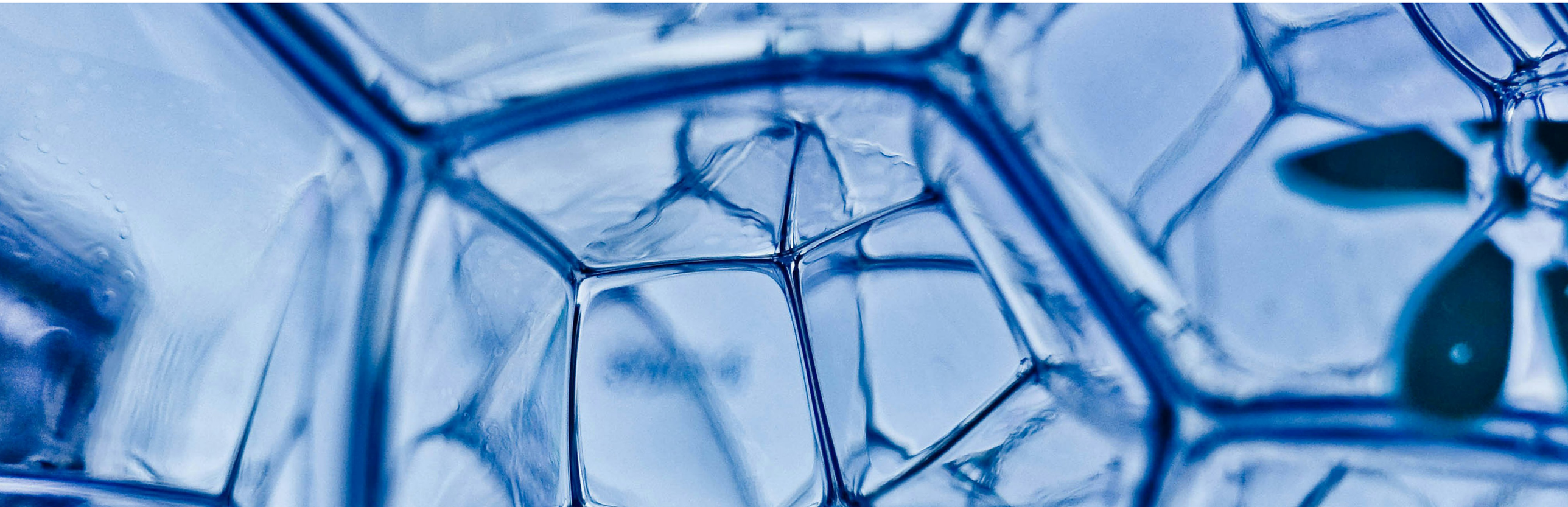
Reverse osmosis: retains everything while allowing only water to pass through.

Reverse osmosis is not only based on a physical principle related to porosity but consists of the dielectric passage of polar molecules: only water with a minimal passage of low-polar substances such as some organic acids (less than 0.2%).

*Some small organic compounds such as organic acids also pass through reverse osmosis membranes, however, due to their low polarity.







ADVANTAGES OF MEMBRANE TECHNOLOGY

Product quality improvement

The product undergoes a single filtration treatment while maintaining the quality and aroma characteristics unaltered.
In contrast, orthogonal filtration with the use of external additives results in the adsorption of aromas and flavours and oxidation of the product.

Physical Filtration Without External Additives

One of the main advantages of membrane filters is that they operate through physical filtration without the need for external additives.

Regenerability and Durability

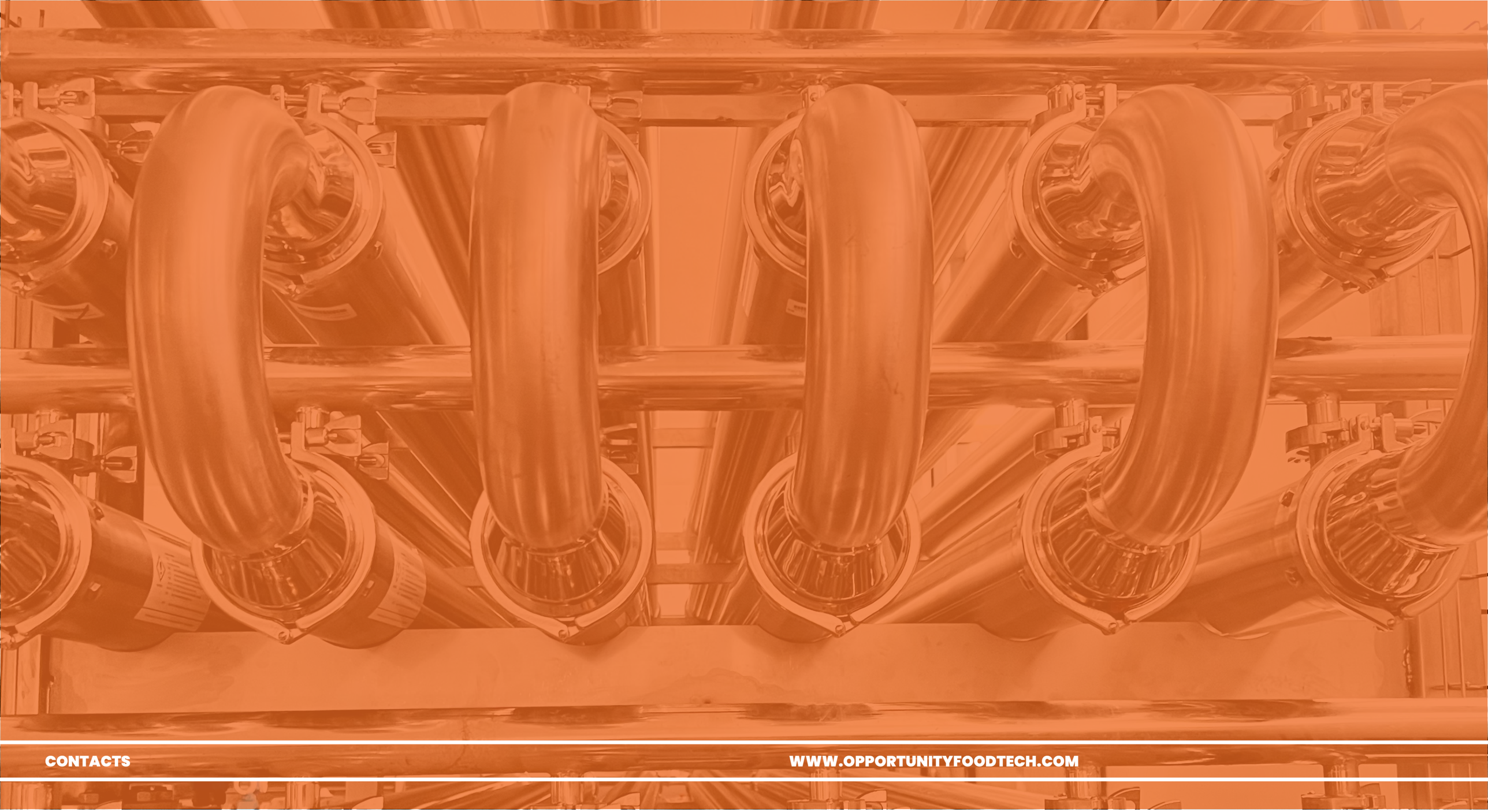
Membrane filtration entails a significant initial investment, but they offer considerable **durability.**
They are designed ***to be regenerable,*** which means they can be cleaned and reused many times.
This helps to reduce long-term costs and extend the life of the system.

Automation and Reduced Labour

Membrane filtration plants are known for their advanced automation:
already prepared for Industry 4.0.
This means that they are less labour-intensive,
as they can mainly be operated automatically.

Recovery of Treatment and Disposal Costs

The enormous reduction in disposal costs is often a decisive factor in the choice of this technology.Separated materials can often be recovered or disposed of more economically, thus contributing to environmental sustainability.
An operator can start and stop the machine easily, unattended during operation, which leads to considerable savings in labour costs.
The higher energy consumption of membrane plants is outweighed by the cost savings due to the reduction in the number of treatments and lower product concentration costs compared to evaporators.



CONTACTS

WWW.OPPORTUNITYFOODTECH.COM

+39 331 215 8440

info.opportunity@foodtech.it

Opportunity SRL

Via Moretto 9/11, - 31028 Vazzola (TV)

Opportunity Foodtech

Opportunity.foodtech

Opportunity foodtech

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