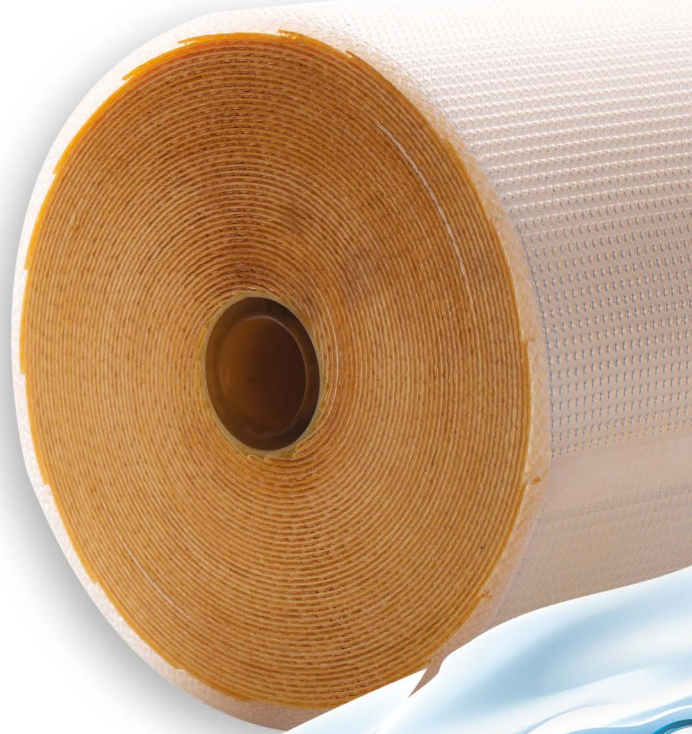




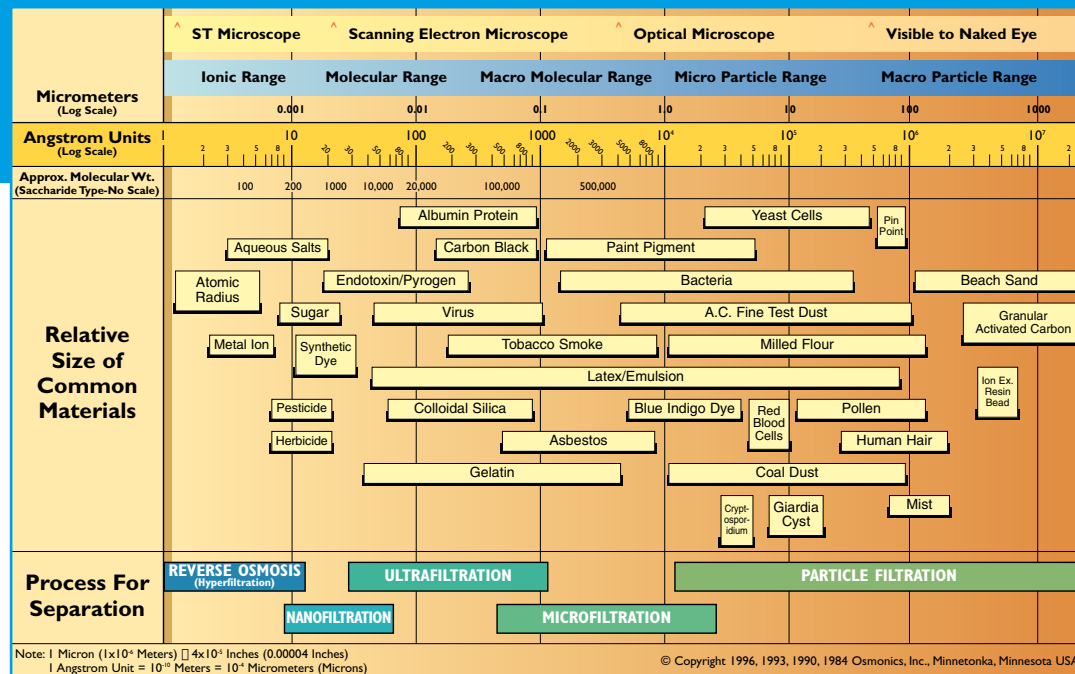
Filtrazione Tangenziale a Membrana
Fluid Separation Process

OUR COMPANY

SEPPRA has been actively involved in the commercialization of equipment and components for water treatment and liquid management plants. The Company stands out for its dynamic involvement in the proposal of innovative technologies and its constant interaction with suppliers allows the development of personalized solutions.

SEPPRA has been a pioneer in the introduction of membrane separation technologies. The first contract with the American manufacturer Osmonics, then leader in the production of spiral wound membranes, dates back to 1983. The Company hasn't slowed down impulse ever since, broadening offers in terms of commercialization and production of components to be applied in systems for the separation and management of fluids.

This has involved collaboration and the establishment of contracts with the main worldwide manufacturers of membranes, as well as an increase in the range of customized product and accessory development. The company is located in Cesano Maderno, 20km North of Milano. The collaborators benefit of a multi-decade experience in the field and a deep knowledge of the proposed technologies.

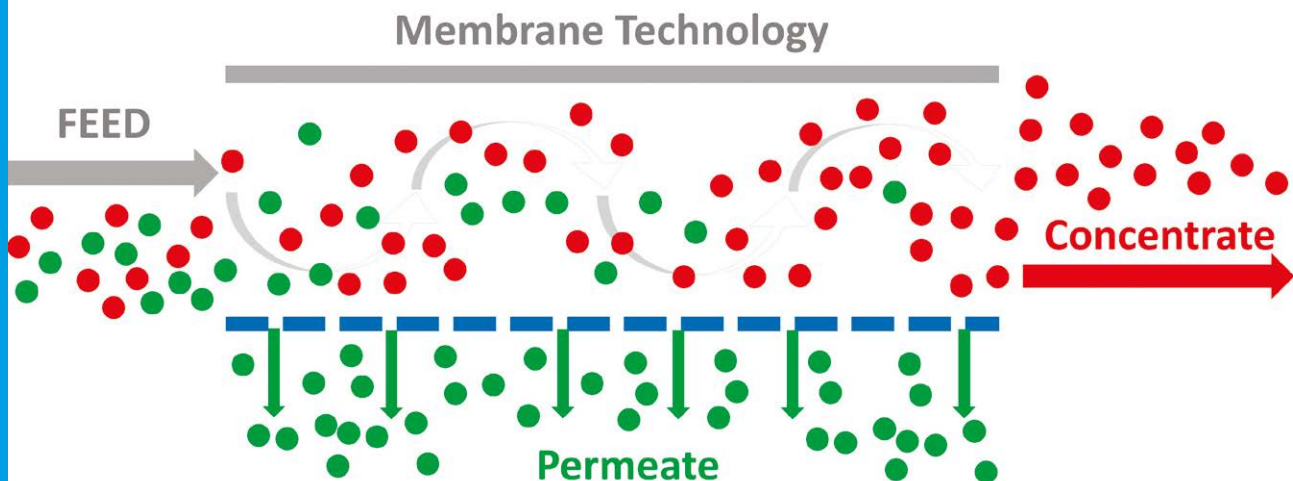


MANAGEMENT OF FLUIDS

SEPPRA offers a wide range of membrane elements for cross filtration processes with different filtration media (polymeric and inorganic). Filtration processes covered ranges from microfiltration to reverse osmosis, passing through ultrafiltration and nanofiltration. In addition to the membranes are all the related accessories and technologies.

Starting from the 2000's, gas separation technologies were added to those regarding membranes for the separation of liquids. Gas/liquid mixing systems were initially developed for ozone and oxygen dissolution applications. The introduction of ozone generators, plus related accessories, was to follow.

SEPPRA's objective was to make available to OEM, engineering companies and EPC contractors advanced technologies for the development of new applications of fluid separation and for the improvement of traditional waste water treatment systems. This activity has been carried on collaborating with the most highly qualified international manufacturers, represented on the Italian market.



PRODUCTS AND TECHNOLOGY

MEMBRANE ELEMENTS FOR CROSS FLOW FILTRATION SEPARATION PROCESSES

- Spiral wound membranes (reverse osmosis, nanofiltration, ultrafiltration, microfiltration)
- Hollow fiber polymeric membranes (submerged and external)
- Tubular ceramic membranes (ultrafiltration and microfiltration)
- Tubular polymeric membranes



TRADITIONAL FILTRATION UNITS

- Industrial filtration cartridges
- Microfiltration cartridges



LABORATORY

- Flat sheet, spiral wound, hollow fiber and tubular membranes and related accessories
- Filtration capsules
- SDI measurement systems
- Bench and field test pilot plants



PRODUCTS &

OZONE AND ACCESSORIES

- Ozone generators
- Air dryers
- Ozone and water mixing systems
- Catalytic ozone destructors
- Instrumentation

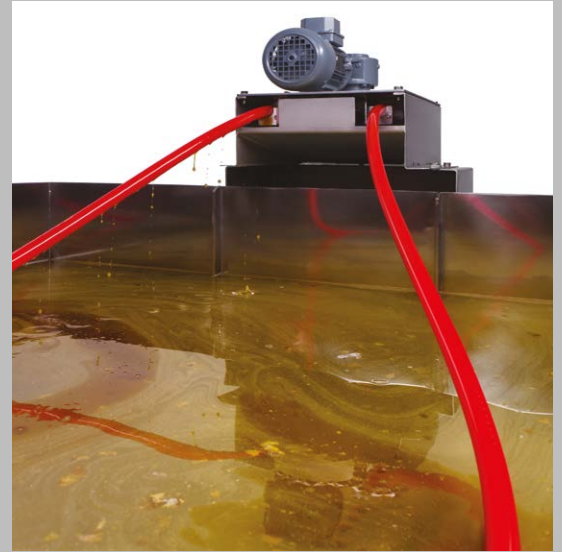


THERE IS A WIDE OFFER IN TERMS OF PRODUCTS AND SERVICES TYPES



OTHER COMPONENTS

- Membrane and filter housings
- Oil removal and purification system
- UV sterilizers
- Magnetic filters
- Plant management services



& SERVICES



COMPONENTS FOR AERATION AND OXYGENATION SYSTEM

- Injectors and nozzles for gas/liquid and liquid/liquid mixing
- Static mixers with nozzles



OUR MARKETS

The management of liquids is a topic that concerns all industrial market segments, as well as the municipal sector. It ranges from the treatment of primary waters, to waste water treatment and recovery, finally arriving to process solutions.

SEPPRA therefore candidates itself to collaboration with multiple potential users, remaining focused on competences in a very specific technology. In a period spanning over thirty years of activity the company has acquired knowledge on a range of very different applications; a few examples of how membrane separation technologies can adapt to seemingly distant needs are provided hereafter.



FOOD & BEVERAGE



MECHANICS & SURFACE TREATMENTS



CHEMICAL ,PHARMACEUTICS & BIOTECHNOLOGIES



TEXTILE INDUSTRY

Often the development of new applications involves performing laboratory and field tests. In this aspect, SEPRA has equipped itself with numerous pilot plants which enable to follow up development of new applications from laboratory to pre-industrial scale.

The range of laboratory and research products is surely one of the company's strengths.



LIQUID WASTE



ENERGY, OIL & GAS



PRIMARY WATER



WASTE WATER

FOOD AND BEVERAGE

Membrane separation technologies have in recent years experienced a significant increase in their applications in the food sector, passing through dairy, wine, juice and beverages, and also important sugar industry.

The concentration of milk and whey takes on an important role in the production of cheese and dairy products in general. Four main processes of membrane separation exist, each specifically designed to allow retention and permeation of specific components of milk (proteins, sugars, ashes) in its passage through the semi permeable membrane.

In the wine cellar, modern cross filtration and selective concentration technologies help wine makers in quickening and improving the production process, without the aid of chemical products.

Sugar refinery processes and the purification and concentration of fruit juices (tomato, apple, red fruits) or sugary extracts are just a few examples of what is potentially attainable with membrane technologies.

In regards to ozone applications, technologies for washing of fruit and vegetables with ozone-enriched water and the use of modified air for products conservation in cold rooms are rapidly gaining popularity.



NUTRACEUTICAL, COSMETICS, PHARMACEUTICS AND BIOTECHNOLOGIES

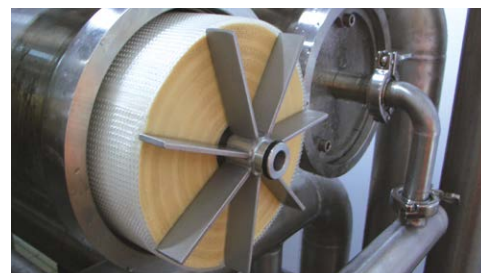
High value products of synthetic or natural origin can be purified and concentrated using membranes: typical examples are the purification/concentration of polyphenols and proteins or the purification/desalination of fermentation process intermediate products.

More and more chemical and pharmaceutical intermediates are produced via fermentation. The clarification and purification of fermentation broths can be performed by high efficiency and low cost with ceramic membranes, allowing separation of culture media from enzymes, proteins, antibiotics and lysates.

The product, once purified from solid particles, can be further refined or concentrated by means of ultra and nanofiltration membrane.

Furthermore, the required standards for the quality of the water used in this type of industry must constantly be raised, especially for those who produce drugs or injectables.

PW or WFI quality water is nowadays produced mainly by membrane means. Cold sanitization of these waters is possible by the aid of ozone injected into the distribution loop upstream of points of use.



MECHANICS, SURFACE TREATMENTS AND PRECIOUS METALS

Coating systems

Electrodeposition coating systems (ED), cataphoretic or anaphoretic, have been part of metal protection processes since decades; they are widely used in the automotive, home appliance and metal components industries, as well as for any other products with electrically conductive surfaces. Ultrafiltration membranes allow recovery of 96-98% color pigments after primary coating, controlling the conductivity of the bath. Similar membranes can also be used for the recovery of other water-based paints.

Flexographic/serigraphic ink concentration

Emulsions and degreasing baths

In mechanical processing, emulsified oil and detaching agent solutions can be continuously regenerated by breaking the emulsion with ultrafiltration membranes and separating the oil from the surfactant. Once the emulsion has been broken, the oil skimmer eliminates in a simple, fast and reliable manner all floating oil and fat from the surface of all kinds of liquids, such as lubricant solutions, cooling water and degreasing agents. Ultrafiltration systems therefore enable the recovery of high quality oil to be sent to the reuse facility at low processing cost.

Precious metal recovery (gold, silver etc)

The recovery of precious metals from spent solutions deriving from various production processes provides a significant source of income with limited management costs. For the mentioned recovery, treatment with ultrafiltration systems is surely the simplest, quickest and most profitable technique.

Other products

Magnetic filters remove metallic particles from all kinds of process liquids, such as lubricants, oil emulsions, rinsing water, cooling water and fuels in a cost efficient way and without the use of chemicals.



SOLID WASTE LEACHATES AND WASTE WATER

SEPPRA offers several technologies for the purification of leachates from landfills, composting and liquid collection platforms. The aim of leachate treatment is to extract purify water in accordance to the concentration limits established by the regulation for discharge in public sewer systems or surface waters.

Membrane bioreactors (MBR) are by now a widely used example of the combination of biological purification and membrane filtration. For industrial applications of easier nature submerged hollow fiber membranes are used, where our ultrafiltration modules are immersed directly into the biological sludge. The advantages arising from this technology are to be seen in the possibility of eliminating the sedimentation unit downstream of the biological compartment with an upgrade in the quality of the treated water.

Anaerobic digestion plants for the production of energy and biofuels from biomasses are becoming increasingly popular. Such systems can be equipped with a membrane system for the separation of biological sludge and solid particles in water from dissolved solids. This complex system takes the name of **AnMBR** (Anaerobic Membrane Bioreactor) and is realised using highly resistant tubular membranes. Alternatively, an MBR system can be used for the purification of digestate prior to reintroduction of water in the environment.





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