APRIA systems

MEMBRANE EQUIPMENT

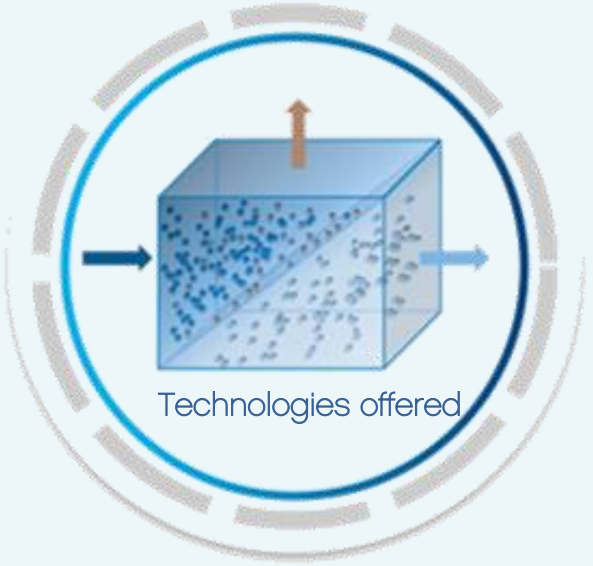
Introduction

We have extensive experience in the design, construction, and commissioning of equipment for **separation processes based on membrane technologies.**

APRIA Systems designs and supplies membrane separation plants **as single stage or integrated in hybrid processes from lab scale up to industrial scale**.

We use **the most cutting-edge technology** to guarantee the viability of the operation to be developed and we select for each application the most suitable membranes and modules.

Each project has its specific needs, so in the cases that require it, **we design and manufacture completely customizable membrane modules.**



- Microfiltration (MF)
- Nanofiltration (NF)
- Ultrafiltration (UF)
- Reverse osmosis (RO)
- Forward osmosis (FO)
- Pressure retarded osmosis (PRO)
- Membrane distillation (MD)
- Gas permeation (GP)
- Electrodialysis (ED)

Technology/ies:

Microfiltration (MF)

Nanofiltration (NF)

Ultrafiltration (UF)

Reverse osmosis (RO)

Forward osmosis (FO)

Pressure retarded osmosis (PRO)

Membrane distillation (MD)

Gas permeation (GP)

Electrodialysis (ED)

Mem

lab / bench / ind

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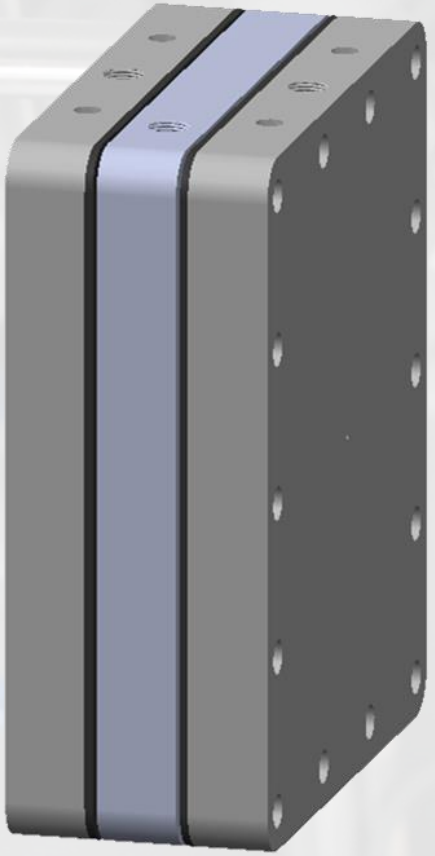
Membrane area:

50 (50 cm^2), 100 (100 cm^2),

900 (900 cm^2), etc.



Available models

Membrane technology	Electrodialysis (ED) / Forward osmosis (FO) / Gas permeation (GP) /Membrane distillation (MD) / Microfiltration (MF) / Nanofiltration (NF) /Pressure retarded osmosis (PRO) / Reverse osmosis (RO) / Ultrafiltration (UF)
Configuration	Plate-and-frame / Hollow-fiber / Spiral wound / Tubular
Volume of treatment / flow rate	Selectable
Operation mode	Alternating / Batch / Continuous
Scale	Laboratory / Pilot / Industrial
Membrane material	Ceramic / Polymeric
Case material	Polycarbonate / Polypropylene (PP) / Stainless steel
Sealing gaskets material	Ethylene propylene diene monomer (EPDM) / Thermoplastic polyurethane (TPU) / Viton®
Connection type	Barb fitting / Quick plug
Optional features	Automatization / Online measurements (pH, O_2, conductivity, etc.) / Temperature control

Memlab MT-140

Characteristics:

- Lab scale.
- Technology: MF, NF, UF, FO, RO, PRO.
- Plate and frame configuration.
- Membrane area: 140 cm^2.
- Maximum flow: 1 m^3/h.

Memlab MF-410

Characteristics:

- Lab scale.
- Technology: microfiltration.
- Ceramic tubular membrane module.
- Treatment flow rate: 3 - 10 L/h.
- Thermostatic and pressurized stainless steel 316 storage tank.
- Measurement and adjustment of inlet temperature, flow rate, and pressure.
- Measurement of the permeate flow rate.
- Distribution and maneuver panel.
- Assembly mounted on aluminum frame.

Membench UF-400000

Characteristics:

- Pilot plant scale.
- Technology: ultrafiltration.
- Treatment flow rate: 1 – 2 m^3/h.
- Membrane module: hollow fiber "dead-end".
- Automatized operation through PLC.
- Online measures of water quality and operational conditions.
- Pretreatment via filtration in porous media.
- Distribution and maneuver panel.
- Assembly mounted on skid.

Membench UF-400000/RO-79000

Characteristics:

- Pilot plant scale.
- Technologies: ultrafiltration and reverse osmosis.
- Hollow fiber “dead-end” in spiral wound membrane module.
- Treatment flow rate: 1 - 2 m^3/h.
- Pre-treatment via filtration in porous media.
- Automatized operation through PLC.
- Online measurement of water quality and operational conditions.
- Distribution and maneuver panel.
- Assembly mounted on skid.

Memlab FO-100/PRO-100

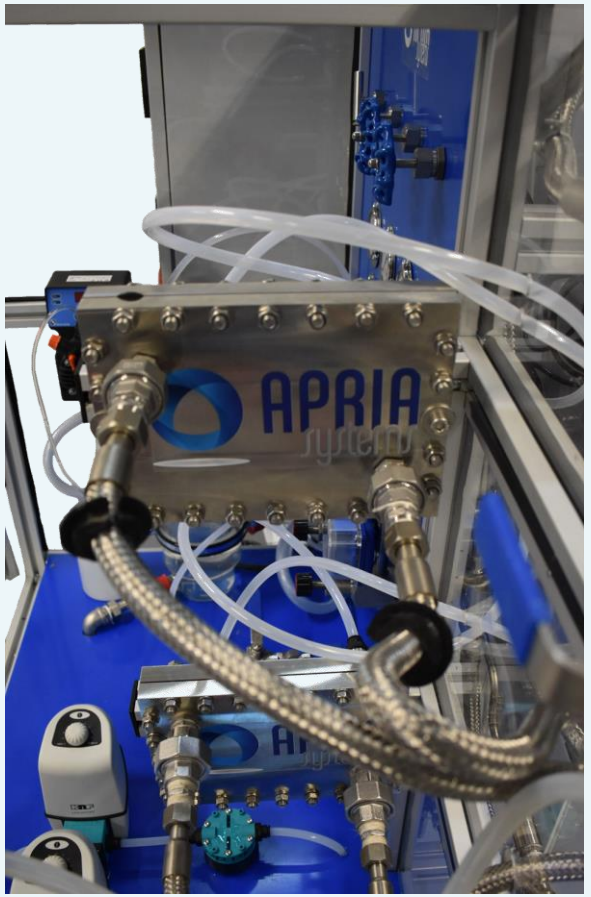
Characteristics:

- Lab scale.
- Technologies: forward osmosis and pressure retarded osmosis.
- High / low pressure pumps with flow control.
- Jacketed tanks with control and regulation of the conductivity.
- Instrumentation for flow rate, pressure, and temperature control.
- Distribution and maneuver panel.
- Assembly mounted on aluminum frame.

Memlab FO-140/PRO-140

Characteristics:

- Lab scale.
- Technologies: forward osmosis and pressure retarded osmosis.
- Exchangeable FO/PRO cells.
- High / low pressure pumps with flow control.
- Jacketed tanks with conductivity control and regulation.
- Instrumentation for flow rate, pressure, and temperature control.
- Temperature control with a chiller.
- Distribution and maneuver panel.
- Assembly mounted on aluminum frame.



Memlab MD-250

Characteristics:

- Lab scale.
- Technology: membrane distillation.
- Configurable DCDM/AGDM cell.
- Storage tank with resistance heating system and thermostat.
- Instrumentation for flow rate, pressure, and temperature control.
- Tank with coil and chiller cooling system with external temperature control.
- Distribution and maneuver panel.
- Assembly mounted on aluminum frame.

Memlab MD-500

Characteristics:

- Lab scale.
- Technology: membrane distillation.
- Operation in DCMD and AGMD.
- Two compartments.
- Total membrane area: 500 cm^2.
- Treatment flow rate: 600 L/h per compartment.

Memlab MD-250

Characteristics:

- Lab scale.
- Technology: membrane distillation.
- Configurable DCDM/AGDM cell.
- Storage tank with resistance heating system and thermostat.
- Instrumentation for flow rate, pressure, and temperature control.
- Tank with coil and chiller cooling system with external temperature control.
- Distribution and maneuver panel.
- Assembly mounted on aluminum frame.

Memlab GP-120

Characteristics:

- Two compartments.
- Total membrane area: 120 cm^2.
- Treatment flowrate: 12 L/h.
- Possibility of including a thermocouple inside

Membench GP-470

Characteristics:

- Pre-pilot scale.
- Technology: gas permeation.
- Hollow-fiber membrane module.
- Serpentine heat exchanger made of borosilicate.
- Instrumentation for flow rate, pressure, and temperature control.
- Distribution and maneuver panel.
- Assembly mounted on aluminum frame.

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