

## M50 CROSS-FLOW FILTRATION PILOT SYSTEM

Technology and service for  
your R+D  
and processes development



## The common ground for R&D and industry



BIONET, backed by twelve years of experience in the construction of equipments for the pharmaceutical, food and biotechnology industries has developed a complete range of laboratory and pilot scale equipments for the industrialization of bioprocesses.

This category includes the M series of filtration membrane pilot units, designed for the development of cross-flow filtration and separation processes and even for small production.

M50 system is the perfect solution for all those seeking a compact system for concentration/purification of bioproducts, not only at pilot but also at small-industrial scale. It can be customized and used for clarification, concentration, fractioning, purification and solvent extraction.

M50 unit is fully scalable, so it can be totally integrated within your processes. Moreover, it allows developing the basic trials to evaluate and develop the following parameters:

- Feasibility of the separation process.
- Maximum achievable concentration factor.
- Cleaning procedures.
- Impact of the operation parameters (cross-flow velocity, pressure and temperature) regarding yields, flows and product quality.
- Optimum membrane pore size.

Typical applications for cross-flow filtration techniques are:

- Clarification.
- Concentration.
- Diafiltration.
- Extraction

## M50

### Tabla de características

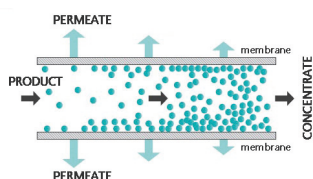
Dimensions and weight	1500(W) x 2250(H) x 785(D) mm and 125 kg
Frame	Frame constructed in stainless steel AISI 304. Wheels incorporated for allowing easy transportation.
Materials	Parts in contact with the product: stainless steel AISI 316. Clamp type gaskets: PTFE. Diaphragm valve: AISI 316 / EPDM. Pump seal: NBR.
Recirculation pump	Centrifugal pump 5.5 kW, controlled by speed variator. Flow: 1-15 m <sup>3</sup> /h; pressure: 0-4.5 barg.
Instrumentation	1 flow indicator within feed stream. 1 flow indicator within permeate stream. 3 manometers for transmembrane pressure control.
Membranes	The pilot plant is supplied with 1 membrane of 1178 mm length, 0.16 m <sup>2</sup> of filtration area and 6 mm of channel diameter.
Control	Manual.
Mechanical interface	Feeding connection: 1 x DN65 DIN 11851. Permeate connection: 1 x male barbed hose OD 12. Concentrate connection: 1 x DN25 DIN 11851.
Electrical interface	400 V, three phase, 50/60 Hz, 20A.
Operating boundary conditions	Maximum operation temperature: 85 °C. Maximum recommended viscosity: 100 cP.

### Opciones disponibles

Operation automation • ATEX compliant version for organic solvent filtration-extraction processes • Incorporation of more membranes with different unitary area to increase filtration surface • Alternative pump technologies depending on the rheology of the medium • Backpulse devices for cleaning enhancement and/or for delaying fouling episodes.

## Cross-flow filtration concept

Cross-flow filtration is an appropriate technology for separation processes where the product contains high amounts of solids and the viscosity depends on concentration grade. The product to be filtered is passed along the membrane at an appropriate pressure and a linear velocity (2-6 m/s) which should be sufficient to assure turbulent flow conditions. This will avoid or delay the accumulation of solids at the membrane surface, maintaining the filterability of the medium.



Ultra and microfiltration are advisable for the filtration of suspended solids, macromolecules, proteins and metabolites. Membrane pore sizes are in the range of 0.14–1.4 µm (microfiltration) and 15–300 kDa (ultrafiltration).

Ceramic membranes offer numerous benefits:

- High temperature resistance (up to 250°C), possibility of steam sterilization (121°C/30 min).
- Compatibility with the whole pH range (0-14) and different type of solvents.
- Compatibility with products containing high amounts of solids and high viscosities.
- Long life time and low replacement rate.

## Examples where cross-flow filtration can be applied

### Biotechnology

- Biomass concentration in fermentation broths.
- Clarification of fermentation broths for supernatant recovery.
- Concentration of supernatants prior to purification steps (chromatography).
- Extraction and clarification of fractions.

### Food and beverages

- Clarification of wines and musts.
- Clarification of fruit juices.
- Clarification of beers.
- Protein recovery from dairy products.



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