

R&D Facilities

➤ R&D staff :

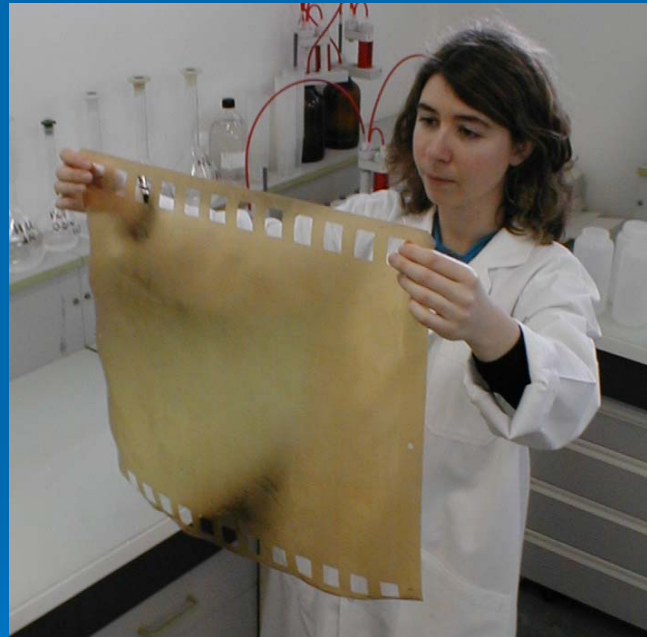
- Permanents : 4 (1 Doctor ; 2 Engineers, 1 technician)
- Contractual : 1 or 2 for 6 months /year
- PhD : 1 or 2 during 3 years – Collaboration with LGC Toulouse ; IEM Montpellier ; INRA Montpellier...
- Students : 2 per year

➤ Budget :

- 10 % of Eurodia Expenditures

ELECTRODIALYSIS

EURODIA supplies both conventional and bipolar ED systems operating with Neosepta® Membranes from TOKUYAMA CORP.



Based on 20 years experience, EURODIA designs and manufactures every electro dialysis configuration to offer the most cost effective solution in order to concentrate, purify and convert

Electrodialysis

- Membranes evaluation
 - New membranes under development
 - Membranes from ED plant : life time evaluation
 - Measures : Electrical resistance ; exchange capacity
- Pilot trials for customers
- Piloting program with customers
- Own research : improvement of our technologies – development of new applications.

Electrodialysis Equipments

➤ ED pilots :

- feasibility trials with small scale EUR2 pilots
10 cells – 0,2 m²

- Conventional ED :

- EUR2B : 2 cpts
- EUR2C : 3 cpts
- EUR2D : 4 cpts

- Bipolar ED : 2 or 3 cpts



Electrodialysis Equipments

- Scale up validation with EUR6 pilot :
 - 50 cells maxi : 2,8 m²
 - Pilot on site : development program with customer.
 - Small production
 - Membrane life time evaluation.
 - Batch and Feed & bleed Pilots



Filtration Equipments

➤ Micro-Filtration :

- Scepter membranes : stainless steel membranes with TiO_2 layer.
 - Porosity : $0,1 \mu\text{m}$
 - Tube diameter : 18 mm
- 3 pilots :
 - $0,07 \text{ m}^2$ for qualitative tests
 - $0,34 \text{ m}^2$ for feasibility test
 - $1,8 \text{ m}^2$ for scale up



Filtration equipments

- Multipurpose micro-pilot :
 - MF, UF, NF with ceramic tubes : 50 cm²
 - MF : 0,2 – 0,5 – 0,8 – 1,4 μm as cut off
 - UF : 20 – 50 – 100 nm
 - NF : 1000 – 5000 daltons
- NF pilot with spiral membranes : 2 x 2.5 m²



Ion Exchange Resins Technologies

- Ion exchange resins :
 - Resins evaluation
 - Complete ion exchange resins process evaluation



Ion Exchange Technologies

➤ Chromatography :

- Development of new applications
 - HPLC chromatogram
 - Pulse test with 500 ml resins
 - Pulse test with 10 L chromato pilot
 - Pilot test with 10 L chromato. Pilot : ISMB – NMCI process
- Validation of application : sampling production
- Resins evaluation

Ion Exchange Resins Technologies

- Analytical equipment :
HPLC Waters Breeze System
 - Isocratic HPLC Pump :
0.01 mL /min to 10 mL/min
 - Injector with heater/cooler
 - Detector refractometer 2414
 - Column heater compartment
 - Breeze system as integrator
 - Column : Shodex SP0810



Ion Exchange Resins Technologies

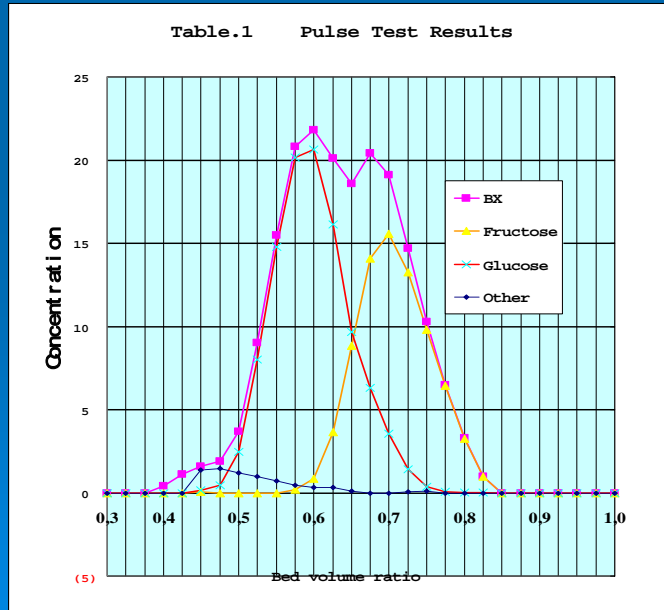
➤ Chromatography column :

- To handle a pulse test with a small volume of product :
 - Column : 1 m length – 26 mm as diameter
 - Resin volume : 480 ml
 - Product volume : 24 ml
 - Flow rate : 240 ml/h
 - Sampling : 12 ml
 - Temperature : 65°C minimum



Chromatography : ISMB - NMCI

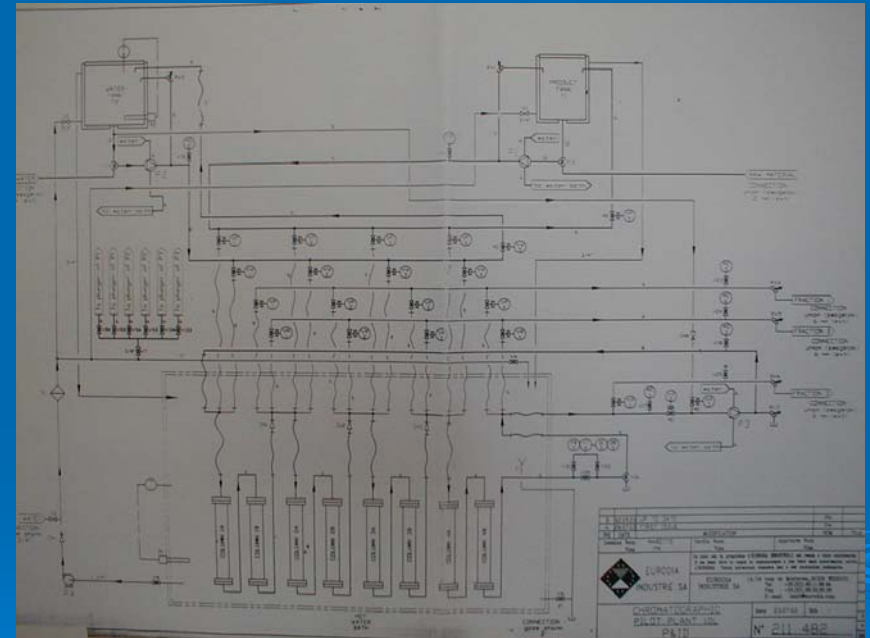
- 10 L chromatography pilot :
 - Pulse test with 450 ml raw product



Chromatography : ISMB - NMCI

➤ 10 L chromatography pilot :

- 8 columns to simulate 4 /6 ISMB & NMCI
- 3 pumps : feed pump – water pump – recirculation pump
- Water bath at right temperature
- Multi-fractions collection



Chromatography : ISMB - NMCI

➤ Validation of separation

- Feed columns with resins + Pulse test : One week
- Optimization of separation : 2 weeks
 - Take fraction and make analysis
 - Tuning with simulation
 - Make a profile
- Raw product volume :
 - 80 L – 100 L / week

