

LABORATORY AND PILOT TESTING EVALUATION OF MEMBRANE TECHNOLOGY

MemBrain offers a two-step evaluation of membrane technology performance:

1. **Laboratory tests**
2. **Pilot trials**

Laboratory tests evaluate the possibility of using membrane processes in solving the actual problem and determine preliminary process conditions. If laboratory tests show promising results, **pilot trials** are performed to validate process conditions and to obtain more detailed information about the composition of the final product and data for scale-up to industrial units. We usually do the laboratory tests in our laboratory and pilot test in customer plant.

1. LABORATORY TESTS

- preliminary information – sustainability of electro dialysis usage
- general mass balance
- general information about process conditions

LABORATORY UNITS

P EDR-Z

Operating flow rate: 45-65 L/hour*

Effective area of ED module: 1344 cm², 2624 cm²*

DC source: 30 V / 3 A, 40 V / 5 A**



Types:

P EDR-Z/2x1	2 circuits, 1 module
P EDR-Z/3x1	3 circuits, 1 module
P EDR-Z/4x1	4 circuits, 1 module
P EDRTR-Z/2x1	2 circuits, 1 module, temperature resistant
P EDRTR-Z/4x1	4 circuits, 1 module, temperature resistant

Example of laboratory unit P EDR-Z/2x1

* depends on module type

** depend on the unit type

2. PILOT TRIALS

Pilot trials are recommended to validate the results of laboratory tests and to obtain more accurate results. They can be also performed without previous laboratory tests in case of solution known to be suitable for membrane processes. Pilot trials are a necessary step for a proper design of full-scale membrane technology.

Results of pilot trials:

- validation of laboratory results
- data for the design of an industrial plant
- detailed mass balance (transport of ions, losses), consumption of water, chemicals and electric energy
- composition of products (diluate and concentrate)

The accomplishment of pilot trials:

- pilot trials performed by MemBrain staff
- pilot trials performed in cooperation with a customer; staff is trained during the trials

PILOT UNIT P1 EDR-Y

Operating flow rate: 0.35-1.0 m³/hour

Effective area of ED module: 2.04 m², 4.04 m²*

DC source: 140 V / 25 A**

Types:

P1 EDR-Y/2x1	2 circuits, 1 module
P1 EDR-Y/2x2	2 circuits, 2 modules
P1 EDR-Y/4x1	4 circuits, 1 module
P1 EDRTR-Y/2x2	2 circuits, 2 modules, temperature resistant



Example of pilot unit P1 EDR-Y/2x2

PILOT UNIT P2 EDR-X

Operating flow rate: 1.2-2.5 m³/hour

Effective area of ED module: 9.53 m², 18.97 m²

DC source: 200 V / 30 A**

Types:

P2 EDR-X/2x1	2 circuits, 1 module
P2 EDR-X/2x2	2 circuits, 2 modules



Example of pilot unit P2 EDR-X