Flex EDR

Advanced Electrodialysis Reversal (EDR)

Ion Exchange Membrane Stack & System:

- Built on 50 years of EDR technology & improved
- Desalt impaired waters, recover chemicals
- Extreme high recovery operation
- Chemical-free softening, selective ion removal
- Cost-effective, modular, and robust

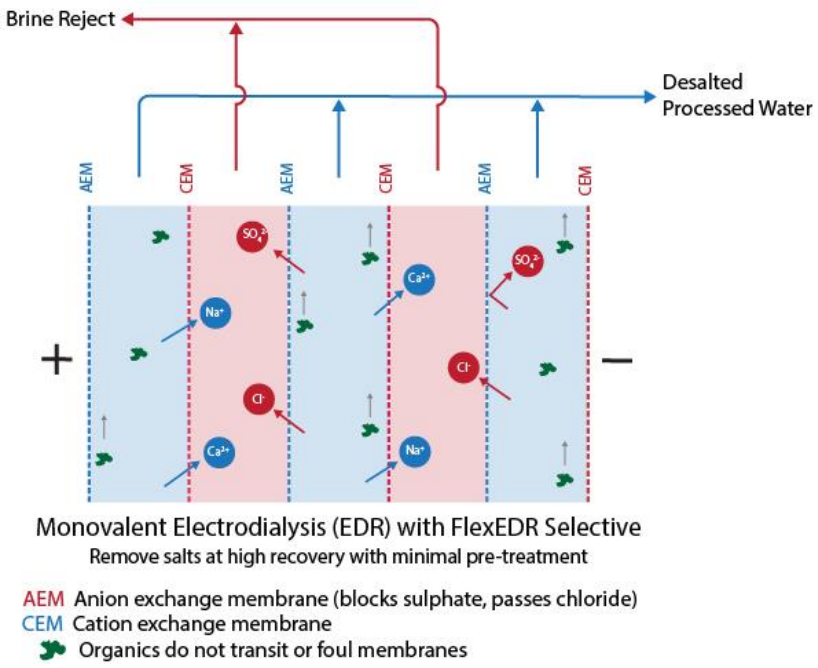
Flex EDR Organix

Desalt organic wastewater or oil & gas produced water.

Flex EDR Selective

Remove monovalent ions with game-changing selectivity.

Multiple Configurations: mED Example



Saltworks' IonFlux Ion Exchange Membranes

Robust Design
Built with highly resilient and ductile IonFlux ion exchange membranes & stacks that can withstand oils, organics, oxidants (bleach), acids (> pH 0), bases (< pH 12) & particulate < 10 µm.

Modular Configuration
Repeatable stacks and skids for ease of expansion, project integration, and maintenance.

Selective Ion Removal
Remove monovalent ions, avoid soda ash softening, change scaling chemistry, recover salts of value.

Automation
Intelligent automation maintains peak performance and enables self-cleaning.

High Concentration & Flexible Operation
Concentrate brines up to 180,000 mg/L. Pair with reverse osmosis for the best of both technologies.

Total Support Options
Complete packaged delivery and installation options. Remote monitoring, 24/7/365 expert assistance & predictive maintenance.

Delivery Methods

Saltworks can deliver complete Flex EDR packages or work with engineering companies & system vendors.

E100 Stack Specifications

Operating Requirements

Operating pressure	34.5 – 310 kPa (5 – 45 PSI)
Hydraulic flow rate (max compartments)	49 – 93 m^3/d (9 – 17 GPM)
pH	0 – 12
Operating Temperature	5 – 60 °C (41 – 140 °F)
Current Density*	5 – 300 A/m^2 (0.5 – 27.9 A/ft^2)
DC Current, Absolute	1 – 53 A
DC voltage, Absolute	10 – 600 V
Inlet TDS	< 80,000 mg/L
Product TDS*	> 100 mg/L
Reject TDS*	< 180,000 mg/L
Suspended Solids	Filter to <10 µm
SDI (5 min)	10
Hydrocarbon tolerance	<C10
Organic Tolerance	Soluble non-charged
Free Chlorine	0 – 200 ppm

Materials of Construction

Wetted Parts	PVC, PP, PVDF, PET, Ti
Hardware	SS316
Frame Structure	Powder-coated steel, Al Base frame optional
Electrodes	Pt-Ir-Ta coated titanium

Specifications

Total membrane area per compartment	0.25 m^2 (2.7 ft^2)
Active membrane area per compartment	0.175 m^2 (1.9 ft^2)
Number of compartments per stack	10 – 200
Compartment Thickness*	0.80 – 3.20 mm (0.031 – 0.126 in)
Outside Dimensions, Stack Only, W x D x H	450 x 762 x 1028 mm (17.75 x 30 x 40.5 in)
Pipe Size	1, 0.5 in

**Project-specific & chemistry dependant*

Sample Applications

- Selectively remove chlorides to lower corrosion potential or recycle FGD wastewater.
- Selectively remove & concentrate lithium.
- Tune outlet TDS to any level.
- Desalt EOR produced water to lower polymer costs & improve hydrocarbon recovery.
- Desalt organic waters with less pre-treatment.

E150 Stack Specifications

Operating Requirements

Operating pressure	34.5 – 310 kPa (5 – 45 PSI)
Hydraulic flow rate (max compartments)	87 – 169 m^3/d (16 – 31 GPM)
pH	0 – 12
Operating Temperature	5 – 60 °C (41 – 140 °F)
Current Density*	5 – 300 A/m^2 (0.5 – 27.9 A/ft^2)
DC Current, Absolute	2 – 101 A
DC voltage, Absolute	10 – 600 V
Inlet TDS	< 80,000 mg/L
Product TDS*	> 100 mg/L
Reject TDS*	< 180,000 mg/L
Suspended Solids	Filter to <10 µm
SDI (5 min)	10
Hydrocarbon tolerance	<C10
Organic Tolerance	Soluble non-charged
Free Chlorine	0 – 200 ppm

Materials of Construction

Wetted Parts	PVC, PP, PVDF, PET, Ti
Hardware	SS316
Frame Structure	Powder-coated steel
Electrodes	Pt-Ir-Ta coated titanium

Specifications

Total membrane area per compartment	0.67 m^2 (7.2 ft^2)
Active membrane area per compartment	0.334 m^2 (3.6 ft^2)
Number of compartments per stack	10 – 300
Compartment Thickness*	0.80 – 3.20 mm (0.031 – 0.126 in)
Outside Dimensions, Stack Only, W x D x H	540 x 960 x 1865 mm (21.25 x 38 x 73.5 in)
Pipe Size	1.5, 1 in

**Project-specific & chemistry dependant*

Sample Applications

- Selectively remove chlorides to lower corrosion potential or recycle FGD wastewater.
- Selectively remove & concentrate lithium.
- Tune outlet TDS to any level.
- Desalt EOR produced water to lower polymer costs & improve hydrocarbon recovery.
- Desalt organic waters with less pre-treatment.

E200 Stack Specifications

Operating Requirements

Operating pressure	34.5 – 310 kPa (5 – 45 PSI)
Hydraulic flow rate (max compartments)	120 – 234 m^3/d (22 – 43 GPM)
pH	0 – 12
Operating Temperature	5 – 60 °C (41 – 140 °F)
Current Density*	5 – 300 A/m^2 (0.5 – 27.9 A/ft^2)
DC Current, Absolute	4 – 225 A
DC voltage, Absolute	10 – 600 V
Inlet TDS	< 80,000 mg/L
Product TDS*	> 100 mg/L
Reject TDS*	< 180,000 mg/L
Suspended Solids	Filter to <10 µm
SDI (5 min)	10
Hydrocarbon tolerance	<C10
Organic Tolerance	Soluble non-charged
Free Chlorine	0 – 200 ppm

Materials of Construction

Wetted Parts	PVC, PP, PVDF, PET, Ti
Hardware	SS316
Frame Structure	Powder-coated steel
Electrodes	Pt-Ir-Ta coated titanium

Specifications

Total membrane area per compartment	1.12 m^2 (12 ft^2)
Active membrane area per compartment	0.753 m^2 (8.1 ft^2)
Number of compartments per stack	10 – 300
Compartment Thickness*	0.80 – 3.20 mm (0.031 – 0.126 in)
Outside Dimensions, Stack Only, W x D x H	603 x 960 x 2235 mm (24 x 38 x 88 in)
Pipe Size	2, 1 in

**Project-specific & chemistry dependant*

Sample Applications

- Selectively remove chlorides to lower corrosion potential or recycle FGD wastewater.
- Selectively remove & concentrate lithium.
- Tune outlet TDS to any level.
- Desalt EOR produced water to lower polymer costs & improve hydrocarbon recovery.
- Desalt organic waters with less pre-treatment.