FlexEDR

Advanced Electrodialysis Reversal (EDR)

Ion Exchange Membrane Stack & System

- Desalts impaired waters and recovers chemicals
- Extreme high recovery operation
- Chemical-free softening, selective ion removal
- Cost-effective, modular, and robust

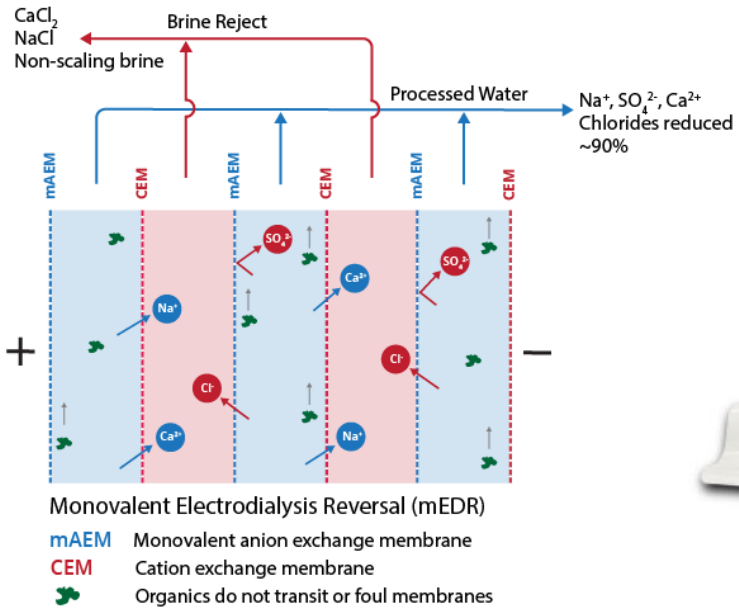
Two Options*

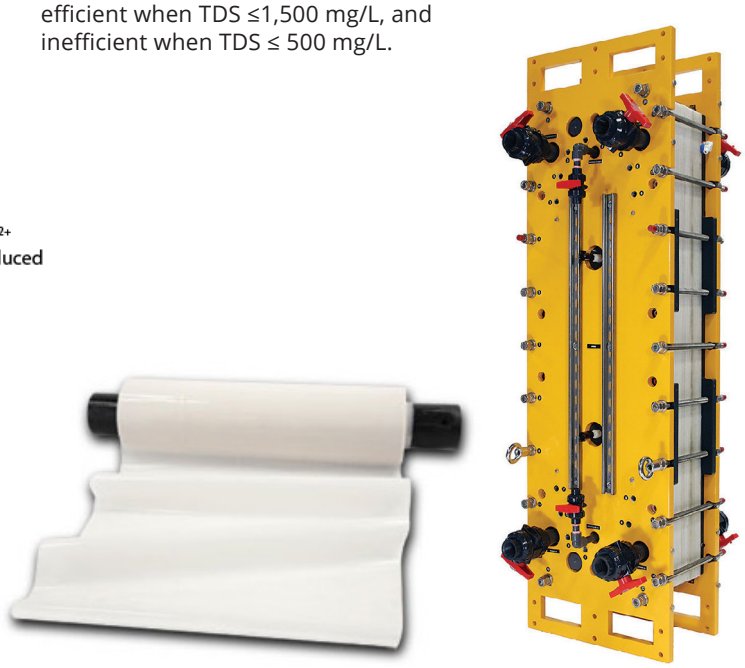
FlexEDR Organix: Desalts organic wastewater or oil & gas produced water.

FlexEDR Selective: Removes monovalent ions with game-changing selectivity.

* Note: All EDR systems become less efficient when TDS ≤1,500 mg/L, and inefficient when TDS ≤ 500 mg/L.

Multiple Configurations: mEDR Example





A roll of Saltworks' IonFlux ion exchange membrane (left), and a FlexEDR E150 stack with membranes assembled (right)

Robust Design

Built with highly resilient and ductile IonFlux ion exchange membranes and stacks that can withstand oils, organics, oxidants (bleach), acids (pH > 0), bases (pH < 12), and 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, and predictive maintenance.

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Saltworks

Operating Requirements	FlexEDR E100 Stack	FlexEDR E150 Stack	FlexEDR E200 Stack
Operating Pressure	34.5–310 kPa (5–45 psi)	34.5–310 kPa (5–45 psi)	34.5–310 kPa (5–45 psi)
Hydraulic Flow Rate (max. compartments)	49–93 m^3/d (9–17 GPM)	87–169 m^3/d (16–31 GPM)	120–234 m^3/d (22–43 GPM)
pH	0–12	0–12	0–12
Operating Temperature	5–45 °C (41–113 °F)	5–45 °C (41–113 °F)	5–45 °C (41–113 °F)
Current Density*	5–300 A/m^2 (0.5–27.9 A/ft^2)	5–300 A/m^2 (0.5–27.9 A/ft^2)	5–300 A/m^2 (0.5–27.9 A/ft^2)
DC Current, Absolute	1–53 A	2–101 A	4–225 A
DC Voltage, Absolute	10–600 V	10–600 V	10–600 V
Inlet TDS	<80,000 mg/L	<80,000 mg/L	<80,000 mg/L
Product TDS*	>100 mg/L	>100 mg/L	>100 mg/L
Reject TDS*	<180,000 mg/L	<180,000 mg/L	<180,000 mg/L
Suspended Solids	Filter to <10 µm	Filter to <10 µm	Filter to <10 µm
SDI (5 min)	10	10	10
Hydrocarbon Tolerance	<C10	<C10	<C10
Organic Tolerance	Soluble non-charged	Soluble non-charged	Soluble non-charged
Free Chlorine	0–200 ppm	0–200 ppm	0–200 ppm

Materials of Construction

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

Specifications

Total Membrane Area per Compartment	0.25 m^2 (2.7 ft^2)	0.67 m^2 (7.2 ft^2)	1.12 m^2 (12 ft^2)
Active Membrane Area per Compartment	0.175 m^2 (1.9 ft^2)	0.334 m^2 (3.6 ft^2)	0.753 m^2 (8.1 ft^2)
Number of Compartments per Stack	10–200	10–300	10–300
Compartment Thickness*	0.80–3.20 mm (0.031–0.126 in)	0.80–3.20 mm (0.031–0.126 in)	0.80–3.20 mm (0.031–0.126 in)
Outside Dimensions, Stack Only (W × D × H)	450 × 762 × 1028 mm (17.75 × 30 × 40.5 in)	540 × 960 × 1865 mm (21.25 × 38 × 73.5 in)	603 × 960 × 2235 mm (24 × 38 × 88 in)
Pipe Size	1, 0.5 in	1.5, 1 in	2, 1 in

* Project-specific and chemistry-dependent

Sample Applications

FlexEDR can selectively remove chlorides to lower corrosion potential or recycle FGD wastewater, selectively remove and concentrate lithium, tune TDS to any level, desalt EOR-produced water to lower polymer costs, and more.

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