

# FlexEDR

## 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

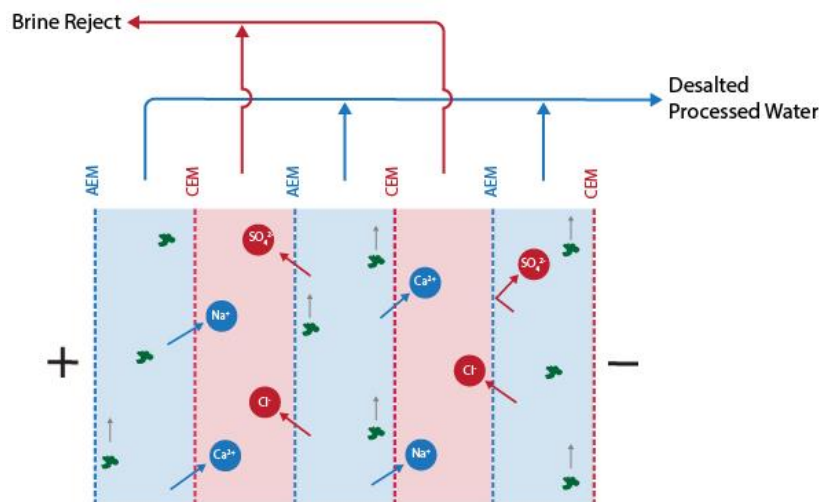
### FlexEDR Organix

*Desalt organic wastewater or oil & gas produced water.*

### FlexEDR Selective

*Remove monovalent ions with game-changing selectivity.*

### Multiple Configurations: mED Example



Monovalent Electrodialysis (EDR) with FlexEDR Selective  
Remove salts at high recovery with minimal pre-treatment

- AEM Anion exchange membrane (blocks sulphate, passes chloride)
- CEM Cation exchange membrane
- Organics do not transit or foul membranes



*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.

### Selective Ion Removal

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

### High Concentration & Flexible Operation

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

### Modular Configuration

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

### Automation

Intelligent automation maintains peak performance and enables self-cleaning.

### Total Support Options

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

## Delivery Methods

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

# FlexEDR E100 Stack Specifications

## Operating Requirements

|   |   |
|---|---|
| <b>Operating pressure</b>                         | 34.5 – 310 kPa<br>(5 – 45 PSI)                              |
| <b>Hydraulic flow rate<br/>(max compartments)</b> | 49 – 93 m <sup>3</sup> /d<br>(9 – 17 GPM)                   |
| <b>pH</b>   | 0 – 12  |
| <b>Operating Temperature</b>                      | 5 – 45 °C (41 – 113 °F)                                     |
| <b>Current Density*</b>                           | 5 – 300 A/m <sup>2</sup><br>(0.5 – 27.9 A/ft <sup>2</sup> ) |
| <b>DC Current, Absolute</b>                       | 1 – 53 A  |
| <b>DC voltage, Absolute</b>                       | 10 – 600 V  |
| <b>Inlet TDS</b>                                  | < 80,000 mg/L   |
| <b>Product TDS*</b>                               | > 100 mg/L  |
| <b>Reject TDS*</b>                                | < 180,000 mg/L  |
| <b>Suspended Solids</b>                           | Filter to <10 µm  |
| <b>SDI (5 min)</b>                                | 10  |
| <b>Hydrocarbon tolerance</b>                      | <C10  |
| <b>Organic Tolerance</b>                          | Soluble non-charged   |
| <b>Free Chlorine</b>                              | 0 – 200 ppm   |

## Materials of Construction

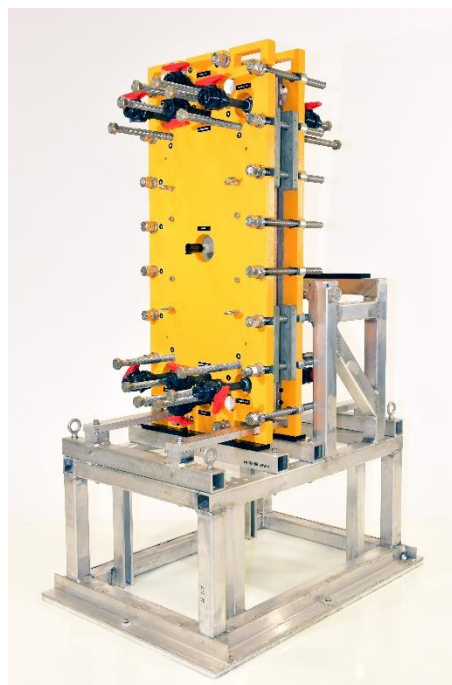
|                        |  |
|------------------------|--|
| <b>Wetted Parts</b>    | PVC, PP, PVDF, PET, Ti                         |
| <b>Hardware</b>        | SS316  |
| <b>Frame Structure</b> | Powder-coated steel,<br>Al Base frame optional |
| <b>Electrodes</b>      | Pt-Ir-Ta coated titanium 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

## Specifications

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

## 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.



\*Project-specific & chemistry dependant

# FlexEDR E150 Stack Specifications

## Operating Requirements

|   |   |
|---|---|
| <b>Operating pressure</b>                         | 34.5 – 310 kPa<br>(5 – 45 PSI)                              |
| <b>Hydraulic flow rate<br/>(max compartments)</b> | 87 – 169 m <sup>3</sup> /d<br>(16 – 31 GPM)                 |
| <b>pH</b>   | 0 – 12  |
| <b>Operating Temperature</b>                      | 5 – 45 °C (41 – 113 °F)                                     |
| <b>Current Density*</b>                           | 5 – 300 A/m <sup>2</sup><br>(0.5 – 27.9 A/ft <sup>2</sup> ) |
| <b>DC Current, Absolute</b>                       | 2 – 101 A   |
| <b>DC voltage, Absolute</b>                       | 10 – 600 V  |
| <b>Inlet TDS</b>                                  | < 80,000 mg/L   |
| <b>Product TDS*</b>                               | > 100 mg/L  |
| <b>Reject TDS*</b>                                | < 180,000 mg/L  |
| <b>Suspended Solids</b>                           | Filter to <10 µm  |
| <b>SDI (5 min)</b>                                | 10  |
| <b>Hydrocarbon tolerance</b>                      | <C10  |
| <b>Organic Tolerance</b>                          | Soluble non-charged   |
| <b>Free Chlorine</b>                              | 0 – 200 ppm   |

## Materials of Construction

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

## Specifications

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

## 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.



\*Project-specific & chemistry dependant

# FlexEDR E200 Stack Specifications

## Operating Requirements

|   |   |
|---|---|
| <b>Operating pressure</b>                         | 34.5 – 310 kPa<br>(5 – 45 PSI)                              |
| <b>Hydraulic flow rate<br/>(max compartments)</b> | 120 – 234 m <sup>3</sup> /d<br>(22 – 43 GPM)                |
| <b>pH</b>   | 0 – 12  |
| <b>Operating Temperature</b>                      | 5 – 45 °C (41 – 113 °F)                                     |
| <b>Current Density*</b>                           | 5 – 300 A/m <sup>2</sup><br>(0.5 – 27.9 A/ft <sup>2</sup> ) |
| <b>DC Current, Absolute</b>                       | 4 – 225 A   |
| <b>DC voltage, Absolute</b>                       | 10 – 600 V  |
| <b>Inlet TDS</b>                                  | < 80,000 mg/L   |
| <b>Product TDS*</b>                               | > 100 mg/L  |
| <b>Reject TDS*</b>                                | < 180,000 mg/L  |
| <b>Suspended Solids</b>                           | Filter to <10 µm  |
| <b>SDI (5 min)</b>                                | 10  |
| <b>Hydrocarbon tolerance</b>                      | <C10  |
| <b>Organic Tolerance</b>                          | Soluble non-charged   |
| <b>Free Chlorine</b>                              | 0 – 200 ppm   |

## Materials of Construction

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

## Specifications

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

## 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.



\*Project-specific & chemistry dependant