

# Ionics\* MKIV Electrodialysis Reversal (EDR) Stack

## FACT SHEET

### Electrodialysis Reversal (EDR) Stack for Desalination

#### Description and use

Veolia's Ionics MKIV EDR stacks are used for desalination of a variety of water streams with flow rates up to 190 GPM (43 m<sup>3</sup>/h) per line. The stacks can be configured for hydraulic staging inside a single stack and set in series within a system to achieve different levels of demineralization for different flow rates.

#### Typical applications

Ionics MKIV EDR stacks are used on a range of water types for the removal of charged contaminants such as total dissolved solids (TDS), nitrate, arsenic, radionuclides, fluoride, sulfate and chloride.

The most typical applications are:

- Desalination of ground and surface brackish water for drinking water applications
- TDS removal from tertiary-treated wastewater for irrigation or to meet discharge requirements
- Recovery of industrial wastewater (not for 750 cell stacks)



#### General properties

- Up to 750 active cells of Ionics ion-exchange membranes and MKIV spacers
- Up to 240 m<sup>2</sup> of active membrane area
- Robust stack design that is capable of clean-in-place (CIP) and can be easily removed and disassembled for maintenance and component replacement if necessary. Spare parts can be easily stored on site.
- High water recovery, up to 94%.

## Feed guidelines

|                                                 |                                   |
|-------------------------------------------------|-----------------------------------|
| Typical Feed TDS.....                           | 100 to 4,000 ppm (mg/l)           |
| Maximum Feed TDS.....                           | contact Veolia                    |
| Silica (Reactive).....                          | 125 mg/l (up to saturation)       |
| pH .....                                        | 2 to 9                            |
| SDI (5 min. test).....                          | <12                               |
| Turbidity .....                                 | < 0.5 NTU                         |
| Free Chlorine (continuous) <sup>(1)</sup> ..... | 0.5 ppm (mg/l)                    |
| TOC .....                                       | < 15 ppm (mg/l)                   |
| COD.....                                        | < 50 ppm (mg/l) as O <sub>2</sub> |
| Iron.....                                       | < 0.3 ppm (mg/l)                  |
| Manganese, Aluminum.....                        | < 0.1 ppm (mg/l)                  |
| H <sub>2</sub> S.....                           | < 0.1 ppm (mg/l)                  |

### Allowable Intermittent Levels:

|                                    |         |
|------------------------------------|---------|
| SDI (5 min. test) .....            | 15      |
| Turbidity.....                     | 2.0 NTU |
| Free Chlorine <sup>(1)</sup> ..... | 30 mg/l |

(1) Chlorine levels are to be discussed with your Veolia contact as oxidizing agents can be harmful for certain membranes in certain conditions. Exposure to chlorine is only permitted for stacks using 204 / 67 membranes, not for stacks with 908 / 67 membranes.

## Certifications

- NSF/ANSI/CAN 61 - Drinking water
- NSF/ANSI 372 – Lead free
- BSE/TSE guidance EMEA/410/1 - Rev3; Section 3.1 – No Materials of Animal Origin
- DWI regulation 31
- EN 61010-1:2010, harmonized standard for conformity to the Low Voltage Directive 2014/35/EU

## Operating parameters

|                             |                         |
|-----------------------------|-------------------------|
| Silica Removal.....         | none                    |
| Temperature.....            | 40 to 100°F (4 To 38°C) |
| Maximum Feed Pressure ..... | 50 psi                  |
| Input Voltage .....         | 480VAC / 3 / 60Hz       |

## Material of construction

|                  |                                                    |
|------------------|----------------------------------------------------|
| Endplate.....    | Carbon steel + PVC                                 |
| Piping.....      | PVC                                                |
| Electrodes ..... | Metal electrodes or resin-coated carbon electrodes |
| Spacers .....    | PP mesh embedded in EVA gasket                     |

## Typical stack configurations<sup>2</sup>

| Part#   | Description                              | Membranes  | Electrodes | Connector | Orientation |
|---------|------------------------------------------|------------|------------|-----------|-------------|
| 3207408 | EDR-STACK,MK4,600C,1/1,204E/67E,CE,CL-R  | 204E / 67E | Carbon     | Camlock   | Right       |
| 3207409 | EDR-STACK,MK4,600C,1/1,204E/67E,CE,CL-L  | 204E / 67E | Carbon     | Camlock   | Left        |
| 3207223 | EDR-STACK,MK4,600C,1/1,204E/67E,MTL,CL-R | 204E / 67E | Metal      | Camlock   | Right       |
| 3207222 | EDR-STACK,MK4,600C,1/1,204E/67E,MTL,CL-L | 204E / 67E | Metal      | Camlock   | Left        |
| 3207421 | EDR-STACK,MK4,600C,1/1,204E/67E,CE,ST-R  | 204E / 67E | Carbon     | Staubli   | Right       |
| 3207420 | EDR-STACK,MK4,600C,1/1,204E/67E,CE,ST-L  | 204E / 67E | Carbon     | Staubli   | Left        |
| 3207523 | EDR-STACK,MK4,600C,1/1,204E/67E,MTL,ST-R | 204E / 67E | Metal      | Staubli   | Right       |
| 3195884 | EDR-STACK,MK4,600C,1/1,204E/67E,MTL,ST-L | 204E / 67E | Metal      | Staubli   | Left        |
| 3159168 | EDR-STACK,MK4,600C,1/1,908E/67E,PT,ST    | 908E / 67E | Metal      | Staubli   | /           |
| 3157412 | EDR-STACK,MK4,750CP,1/1,204T/67T,PT,ST   | 204T/67T   | Metal      | Staubli   | /           |
| 3162722 | EDR-STACK,MK4,750CP,1/1,908T/67T,PT,ST   | 908T/67T   | Metal      | Staubli   | /           |

(2) This list doesn't cover all the available 600 cell stacks that we can produce. Additionally, Veolia also manufactures stacks with a smaller number of active cells, configured in 1 or more electrical and hydraulic stages. Please consult your Veolia representative for more information.

## Abbreviations

EDR: Electrodialysis Reversal

TDS: Total Dissolved Solids

SDI: Salt Density Index

TOC: Total Organic Content

COD: Chemical Oxygen Demand