

E-Cell* EDI MK-5 Stack

FACT SHEET

WATER TECHNOLOGIES



Industrial Electrodeionization (EDI) Stacks



Figure 1: E-Cell EDI MK-5 Stack

General Description

As part of the E-Cell electrodeionization (EDI) product line, the E-Cell EDI MK-5 stack is designed to:

- Use electrical current to provide ultrapure water for semiconductor fabrication, power generation, solar panel production, green hydrogen generation and many other heavy industries.
- Deliver premium performance including both the highest levels of product water quality and the lowest energy consumption.
- Minimize cleaning requirements at higher feed water hardness levels using counter-current operation.
- Be leak free, guaranteed with standard 3-year prorated warranty.
- Operate continuously and require no caustic or acid for regeneration of ion exchange resin within the stack.
- Require no brine injection or concentrate recirculation.

Typical Applications

The product water from the E-Cell EDI MK-5 stack can be relied upon to meet today's most demanding ultrapure water applications including:

- Ultrapure water for rinsing of semiconductor chips, solar panels, and other microelectronics
- Demineralized boiler feed water for high pressure boilers found in power plants and other heavy industrial sites
- Ultrapure water for electrolyzer green hydrogen generation.

For ease of design and additional confidence in your EDI application, E-Cell EDI performance projections and guarantees are available in the Winflows Design Simulator or by contacting Veolia.

Quality Assurance

- CE, RoHS, CSA & EAC marked
- Manufactured in an ISO 9001 and ISO 14001 facility
- Certified with UKCA
- E-Cell EDI MK-5 stacks are Halal certified by the Islamic Food and Nutrition Council of America (IFANCA®)

E-Cell EDI MK-5 Stack Specifications	
Nominal Flow	5.0 m ³ /h (22 gpm)
Flow Rate Range	2.3–6.4 m ³ /h (10–28 gpm)
Shipping Weight	165 kg (364 lbs)
Dimensions (width x height x depth)	30 cm x 61 cm x 72cm 12" x 24" x 29"

Product Water Quality ^{Note 1}	
Guarantees Available	
Resistivity	≥ 16 MOhm-cm
Sodium	≤ 3 ppb
Silica (SiO ₂)	As low as 5 ppb
Boron	As low as 0.08 ppb
Typical Removal Efficiencies	
Sodium	≥ 99.9% removal
Silica (SiO ₂)	Up to 99% removal
Boron	Up to 96% removal

Operating Parameters	
Recovery	Up to 97%
Voltage	0–400 VDC
Amperage	0–5.2 ADC
Inlet Pressure ^{Note 2}	≤ 6.9 bar (100 psi)
Pressure Drop ^{Note 3}	1.4–2.8 bar (20–40 psi)

Feed Water Specifications ^{Note 4}	
Total Exchangeable Anions (TEA as CaCO ₃) ^{Note 5}	≤ 65 ppm
Conductivity Equivalent	≤ 112 μS/cm
Temperature	4.4 - 40°C (40–104°F)
Total Hardness (as CaCO ₃) ^{Note 6}	≤ 1.0 ppm
Silica (SiO ₂) ^{Note 7}	≤ 1.0 ppm
Total Organic Carbon (TOC as C)	≤ 0.5 ppm
Total Chlorine	≤ 0.05 ppm
Fe, Mn, H ₂ S	≤ 0.01 ppm
Boron ^{Note 8}	≤ 1.0 ppm
pH	4 to 11
Oil & Grease	None detectable
Particulate ^{Note 9}	RO permeate
Oxidizing Agents	None detectable
Color ^{Note 10}	≤ 5 APHA

Notes:

- Actual performance may vary depending on site conditions. Reference Winflows Design Simulator to verify expected product water quality as well as the resistivity, sodium, and silica performance guarantees that are offered for the design conditions. To obtain boron or other guarantees, contact Veolia.
- Inlet pressure is determined by the downstream pressure requirements for the product and concentrate streams, the choice of counter-current or co-current operation, and stack pressure drop.
- At nominal flow and 25°C. Reference Winflows Design Simulator to verify for design conditions.
- Reference the Winflows Design Simulator and the E-Cell EDI Stack Owner's Manual to verify feed water specifications for the design conditions.
- TEA (ppm as CaCO₃) - Total Exchangeable Anion, this represents the concentration of all of the anions present in the feed water including contributions from OH⁻, CO₂ and SiO₂. Winflows Design Simulator must be used to confirm the feed water TEA is acceptable at the specific applications' operating conditions. Table value is at minimum flow and maximum temperature.
- 1.0 ppm as CaCO₃ feed water hardness limit applies to standard counter-current flow operation only. Allowable feed water hardness decreases to 0.1 ppm as CaCO₃ in co-current flow operation.

- Allowable silica limit decreases above nominal flow. Allowable silica limit decreases to 0.5 ppm with feedwater hardness above 0.5 ppm as CaCO₃.
- The boron feed level is limited to 0.3 ppm as B whenever there is a silica guarantee requirement or resistivity guarantee requirement above 10 MOhm-cm, as higher boron levels could impact performance. Without these requirements the limit is 1.0 ppm boron.
- Reverse Osmosis (RO) or equivalent feed water: RO provides EDI feed water that is substantially free of particulate matter, colloidal material and high molecular weight organic substances, which can foul ion exchange media. RO permeate quality is specified since EDI stacks contain packed beds of ion exchange medium that cannot be backwashed/fluidized to remove particulate matter. Systems with an open system between a RO system (or other source) and E-Cell EDI systems (ex. tank, decarbonator) must be fitted with filters immediately preceding the E-Cell EDI stack, to protect the E-Cell EDI stack against contamination with particulate matter. Generally, a 5 μm absolute or 1 μm nominal filter will be acceptable.
- APHA - color standard/scale named for the American Public Health Association and defined by ASTM D1209.