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Technical Data Sheet

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Bipolar Membrane Electrodialysis Stack

General Product Information

Captura's Bipolar Membrane Electrodialysis (BMED) stack is a high-performance platform designed for electrochemical conversion of salt feed streams into acid and base. This energy-efficient, fully electrified solution is well suited for a range of industrial applications, including:

- Industrial acid and base production
- Brine valorization
- Sorbent regeneration
- Lithium salt conversion

Key Features

- 200 cell three-compartment electrodialysis stack (BPM, CEM, AEM)
- 94 m^2 of active membrane area per type
- Energy consumption <1.5 kWh/kg NaOH, enabled by Captura's proprietary membranes and stack design
- Proprietary Captura membranes are made with PFAS-free chemistry
- US manufactured membranes and stacks
- Modular, scalable design for straightforward system integration and capacity expansion
- Clean-in-place (CIP) compatible for simplified operation and maintenance



Components and Materials

- Membranes (BPM, CEM, AEM) and spacers
- Platinum coated titanium electrodes
- PVC hydraulic blocks
- Painted carbon steel welded frame/skid
- Hydraulic cylinder
- Electrical leads and piping connections

Not Included:

- Power source
- Pumps, tanks, and filters
- Controls and sensors
- Pretreatment

These components are not included in the standard stack offering. Captura can provide guidance on selection or support in the design and build of a full system.

Technical Specifications of Captura's Standard BMED Stack[1]

Property	Typical Value	Unit
Stack type	Three-compartment BMED	
Number of cells, standard[2]	200	
Full stack dimensions	2.0 x 1.0 x 2.0 (L x W x H)	m
Membrane dimensions	0.5 x 1.5	m
Effective membrane area per type	94	m^2
Operating current density	Up to 800	A/m^2
Stack voltage	Up to 350	V
HCl/NaOH generation rate	Up to 2,300	mol/h
HCl/NaOH concentration	0.5 to 1.0	M
Current efficiency	>80	%
Energy consumption[3]	<1.5	kWh/kg-NaOH

[1] The typical values shown in the table above are based on operation with a 0.5 to 1 M NaCl feed. Performance for alternative feeds and compositions can be evaluated on a project-specific basis.
[2] Captura's current standard full-scale stack configuration is 200 cells. Smaller cell counts are also available.
[3]Energy consumption depends on feed salt composition and concentration, operating temperature, current density, product concentration targets, and system configuration.

Note: *Specifications and performance values provided are representative of typical operation and are subject to change based on system configuration, feed composition, and operating conditions. Final specifications are defined on a project-specific basis. This document is provided for evaluation and planning purposes only and does not constitute a final commercial specification.*

Contact

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