



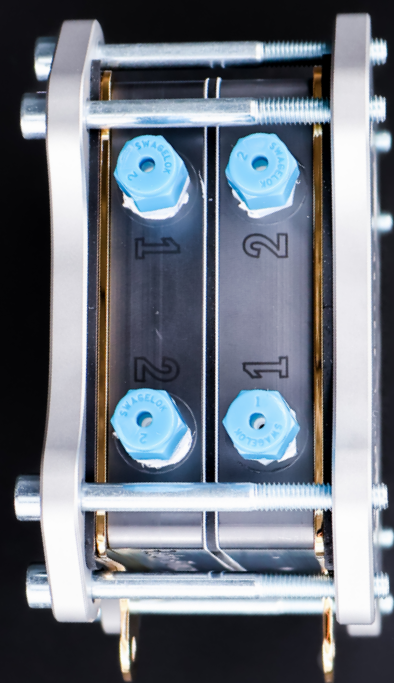
2026
FLOW BATTERIES



THE A-CELL

REDOX FLOW BATTERY TEST CELL

Optimized Flow Battery Test Cell for Advanced *R&D*



The A-Cell

The A-Cell is a high-performance electrochemical flow cell specifically engineered for redox flow battery (RFB) research and development, particularly for thin electrodes ($< 0.5\text{-}1\text{ mm}$). With its integrated interdigitated flow field and robust graphite construction, it provides an ideal platform for precise investigation of RFB chemistries, membrane properties, and electrochemical processes. Its design prioritizes ease of use and rapid assembly, making it a reliable tool for researchers seeking to optimize RFB performance and material selection.

What makes it a great choice for R&D?

- **Optimized for Thin Electrodes.** Ideal for studying electrode materials with thicknesses less than $0.5\text{-}1\text{ mm}$, crucial for many advanced RFB chemistries.
- **Integrated Interdigitated Flow Field.** Ensures uniform electrolyte distribution and minimized internal resistance, enhancing RFB performance and efficiency.
- **Broad Chemical Compatibility.** Constructed from corrosion-resistant dense graphite, ensuring no contact between metal parts and electrolyte solutions, suitable for full pH range operation.
- **Fast Assembly and Disassembly.** Designed for ease of use, allowing for quick experimental setup and component exchange, accelerating research cycles.
- **Standard Active Areas.** Available in $2.5 \times 2.5\text{ cm}$ and $5 \times 5\text{ cm}$ active areas, with options for customization to fit specific experimental needs.
- **Modular Integration.** Compatible with our Flow Through Electrode Holder, Inline Pressure Unit, and AUX Unit for comprehensive in-situ monitoring and data acquisition.

Explore the purpose-built electrochemical flow cell for redox flow battery innovation.

Components & Configuration

Flow bodies

Impermeable graphite composite

2.5 x 2.5 cm or 5 x 5 cm active area

Interdigitated flow-field (standard)
Serpentine, blank, empty groove and other geometries on request.

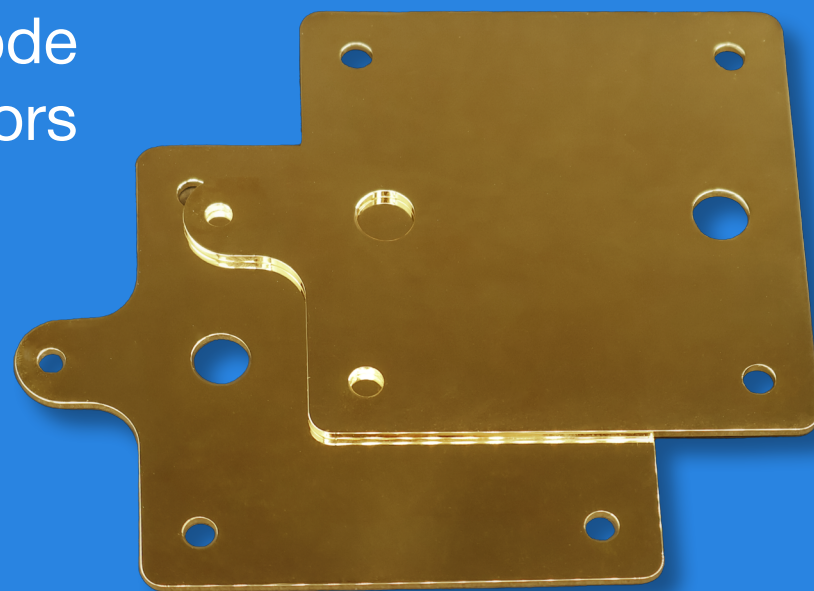
Tight PFA Swagelok fittings installed

Ø2 mm and Ø4mm holes in each side of the graphite blocks thermometers or banana plugs for measurement of potential



Anode and cathode current collectors

Material: Gold-plated copper current collectors (standard)



Alignment bars

For ensuring exact cell alignment with every reassembly

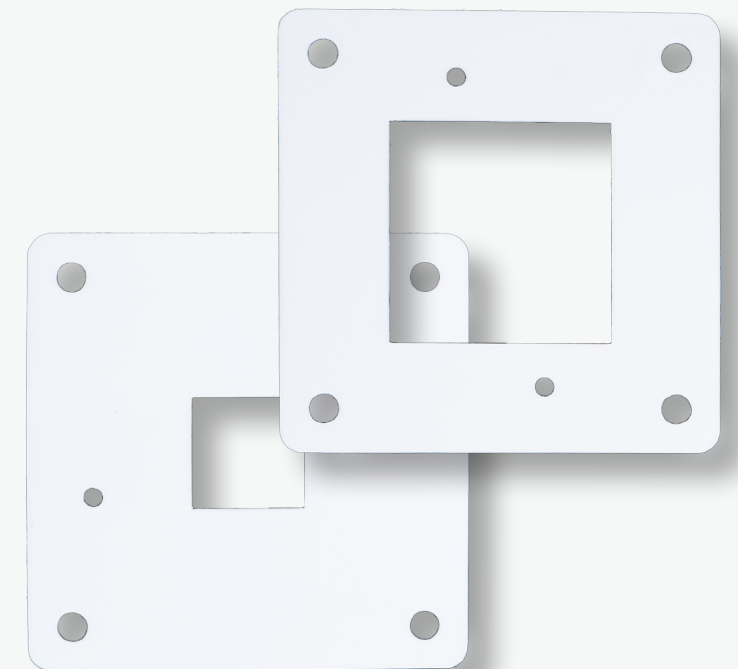


Gaskets

Material: VITON, EPDM, PTFE

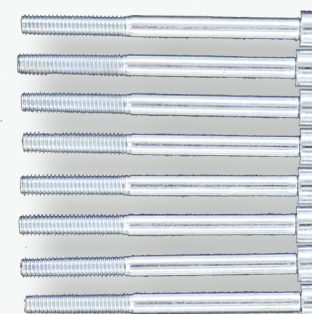
Active area: 2.5 x 2.5 cm, 5 x 5 cm

Thickness: 0.05 mm, 0.1 mm, 0.25 mm, 0.5 mm, 1 mm



M6 Bolts

Standard: 7 cm & 8 cm
Lengths up to 18 cm available



About the cell

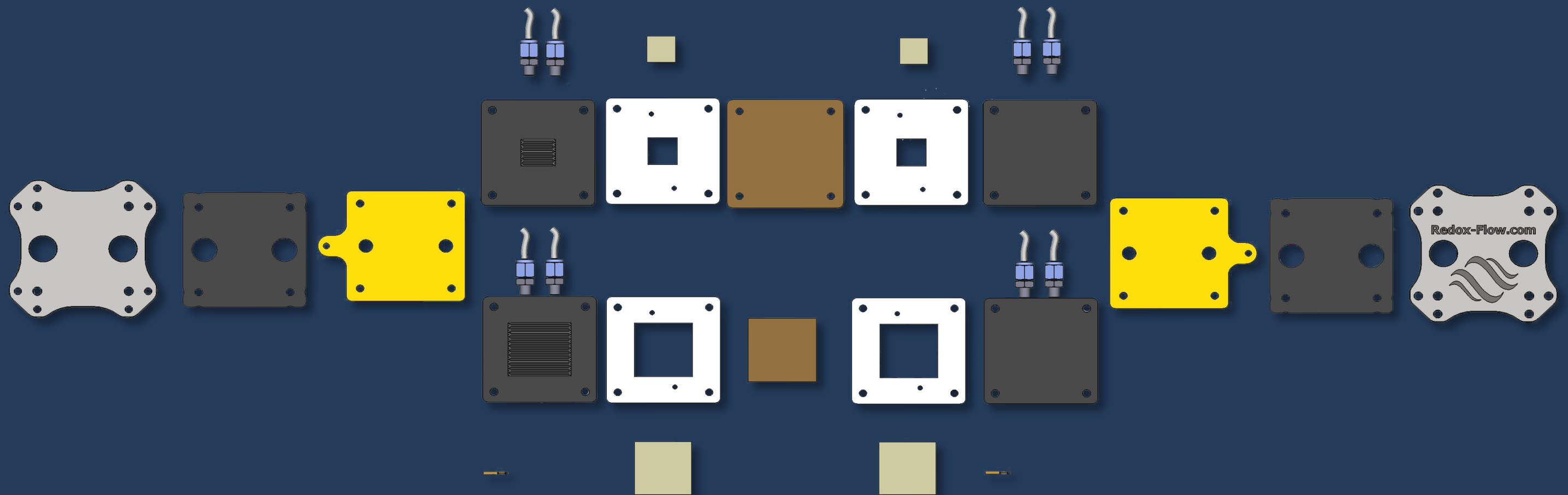
Optimized Electrochemical Cell for Redox Flow Battery R&D

The A-Cell is a foundational product from Redox-Flow.com, trusted by over 100 research groups and companies globally for nearly a decade. It is specifically designed for general redox flow battery research and development, particularly for applications involving thinner electrodes. The cell's robust design, featuring corrosion-resistant dense graphite, ensures that the electrolyte is only in contact with inert materials, preventing contamination and preserving electrode integrity. Its integrated interdigitated flow field is optimized for RFB applications, delivering high performance and minimal internal resistance. The A-Cell's ease of use and modularity make it an indispensable tool for advancing RFB technology.

Key Features and Flexibility

- **Optimized for RFB Performance** - Integrated interdigitated flow field and material selection minimize internal resistance and maximize efficiency.
- **Robust Graphite Construction** - Electrolyte contacts only graphite, gaskets (PTFE, Viton, EPDM), O-ring, bipolar plate, electrode, and membrane, ensuring high chemical resistance.
- **Integrated Monitoring Capabilities** - Connects seamlessly with Flow Through Electrode Holder, Inline Pressure Unit, UV/MIS and OCV Cell for comprehensive in-situ diagnostics.
- **Versatile Conversion** - Can be converted into an S-Cell or X-Cell configuration with additional components, offering flexibility for various electrochemical energy conversion technologies.
- **Ease of Use** - Designed for fast assembly and disassembly, ideal for dynamic research environments.
- **Long-Standing Reliability** - A proven product with a decade of market presence and widespread adoption in the RFB research community.





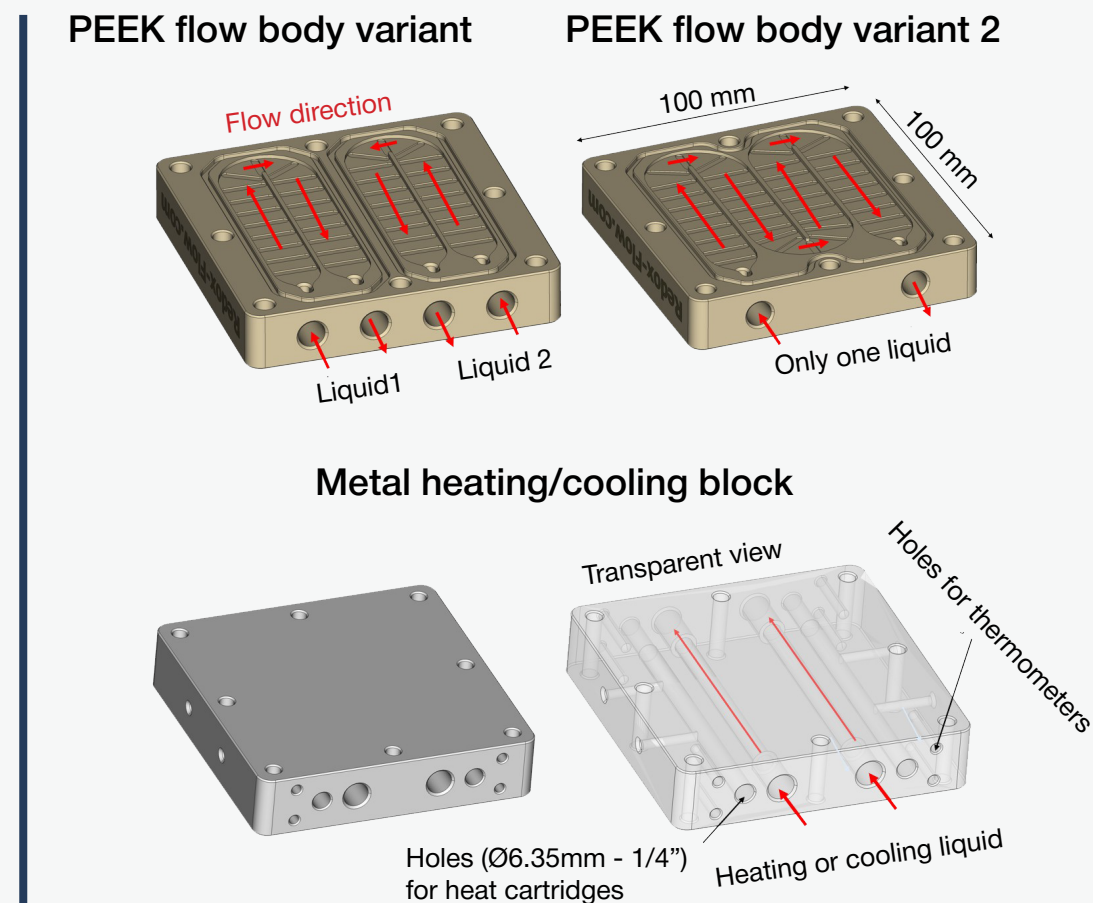
Flexible Cell Configuration

The A-Cell features an integrated interdigitated flow field, simplifying gasket configuration for optimal performance with thin electrodes. This design minimizes the risk of leakage and ensures precise electrolyte distribution. Gaskets are crucial for accommodating electrode thickness and ensuring a tight seal.

Temperature control

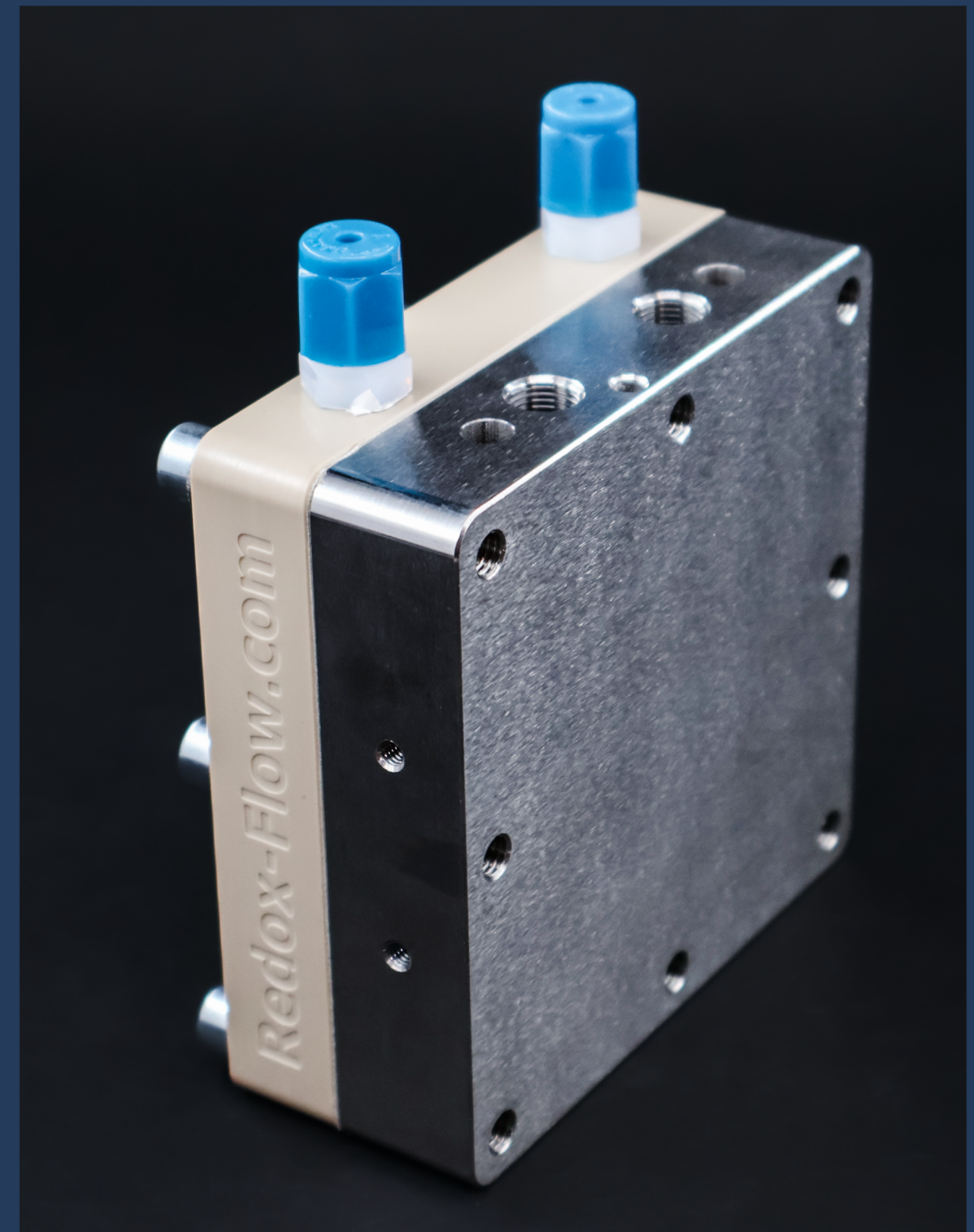
Temperature Control Unit

This system can be used in combination with a dedicated temperature control setup based on a flow heat exchanger principle. To the best of our knowledge, similar products cannot be found by any other companies in the field.



Our solution comes as three different configurations that are based on the same components and can be interchanged. All options are based on a PEEK flow body and metal block shown above. The PEEK body contains one (variant 1) or two separate (variant 2) flow chambers for heating/cooling one or two independent liquids, respectively. The liquids in the experimental setup are circulated through the PEEK flow body and placed up against a metal heating/cooling plate, whereby heat is transferred to or from the liquids in the PEEK flow body. The metal plate is separated from the liquids by a thin PTFE sheet, whereby corrosive/oxidative solutions also can be heated without corroding the metal plate.

Besides the possibility for placing the metal block on a heating plate, it also comes with holes for heat cartridges, cooling liquids, and thermometers.



Accessories



Inline Pressure Unit

Differential Pressure Measurement Unit.

- Compact, inline design for direct differential pressure measurement
- Monitor hydraulic resistance of electrodes with high accuracy
- Integrated temperature sensing for added diagnostics
- Built from chemically highly resistant materials



Open Circuit Voltage Cell

Reference Cell For OCV & Potential Monitoring.

- For accurate anode/cathode potential measurement
- Multifunctional design for OCV and overpotential studies
- Easy integration into existing setups with internal reference electrolyte chamber
- Durable graphite flow bodies ensure chemical resistance and stability



UV/VIS Flow Cell

UV/VIS Fiber Optical Flow-Cell.

- Adjustable optical path length (0.05–8 mm) for maximum flexibility
- Supports high flow rates (>100 ml/min) with minimal pressure loss from unique design with hydraulic bypass
- Connects with standard fiber based spectrometers using SMA 905 connectors



Flow-through electrode holder

Inline Reference Potential Measurement Unit.

- Fits a wide range of electrode diameters (3–17 mm)
- Durable, chemically resistant construction
- Measures e.g. pH, ORP, or reference potential.

Compatibility

The A-Cell offers inherent flexibility within the Redox Flow ecosystem. While purpose-built for redox flow battery research with thin electrodes, its modular design allows for conversion into other cell types to expand experimental capa-

Easily Convertible into an S-Cell or X-Cell

The A-Cell can be converted into an S-Cell (for thicker electrodes) or an X-Cell (for broader electrolysis applications) by acquiring specific additional components, offering long-term versatility for your research needs.



Modular Design

Part of a family of electrochemical cells that share common design principles, ensuring ease of use and interchangeability of certain components.

Application Areas

General flow battery & electrochemical flow cell for any type of chemistry

- General Redox Flow Battery R&D in particular for thinner electrodes
- PEM/Alkaline Fuel Cells
- General-purpose electrochemical flow testing
- Membrane property testing

Technical Specifications

Active Area: 2.5cm x 2.5cm and 5cm x 5cm

Gold-plated Copper Flat Current Collectors

Main flow body in Graphite

Can be operated up to 95°C

Full pH range – depending on current collector and gasket materials

Swagelok fittings for tight connecting to 1/8" tubing

Gasket Materials: PTFE, EPDM or VITON

Electrode thickness < 0.5mm-1 mm

Interdigitated flow field

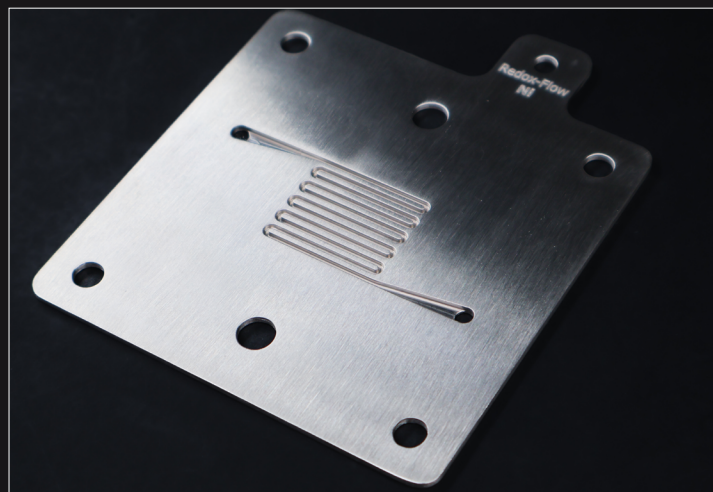
We accommodate custom requests for active area sizes, materials for current collectors, and tubing dimensions. For this, submit a request on www.redox-flow.com.



Our Solutions

Born from PhD project that identified *the need for modular design* in flow cell R&D, we've grown in five years into a startup with *over 1,000 customers worldwide*.

WWW.REDOX-FLOW.COM



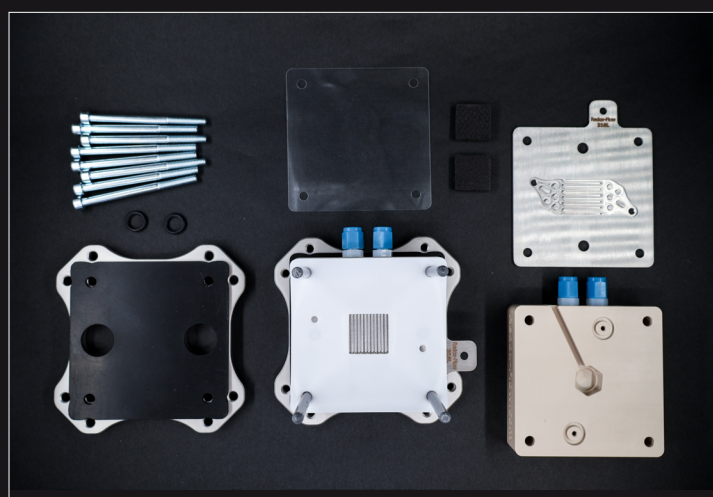
Custom

Electrochemical research is constantly evolving — and so are we. Whether you want to test a new material, explore a novel geometry, or build something entirely from scratch, we're here to help. Serpentine flow fields, BMED cell designs, custom gasket shapes — these are just a few of the projects we've taken on over the years. From small design tweaks to full custom builds, we've got you covered.



One-Stop

We sell Complete Flow Battery Setups — including the flow cell, pump, hydraulic connection pack, battery control unit, and all the fittings and gaskets needed for a classic R&D setup. Everything arrives ready to run, so you can skip the sourcing headaches and get straight to experimentation. If you're looking for an out-of-the-box solution, this is the easy choice.



Modular & Scalable

Our flow cells are built to be flexible and upgradable. Parts are compatible across our entire cell range, so switching to a completely different chemistry is as simple as swapping a few components — no need for a new cell. Assembly and disassembly are equally straightforward, giving you the freedom to experiment as your research demands. Add extra parts to upgrade a single cell into a stack, or order replacement flow bodies and gaskets for electrode and membrane testing. One cell really can do a lot.

Redox Flow[®] Family





WWW.REDOX-FLOW.COM

Any questions?
We're happy to hear from you.



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