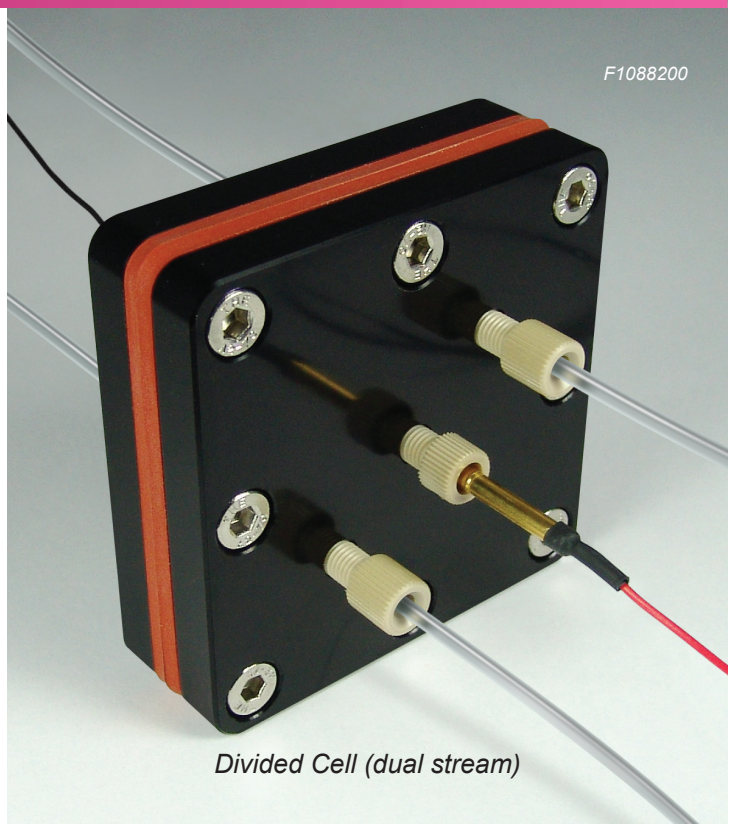
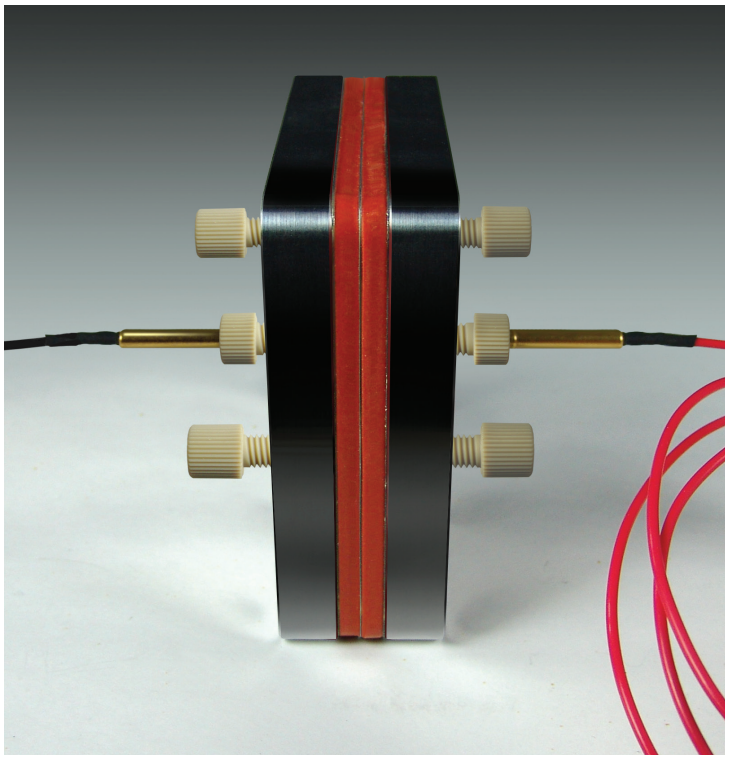
Flow Electrolysis

Replication is an impediment in the path of scientific progress, especially for experiments conducted using electrolysis. This challenge primarily comes from an abundance of non-standard setups requiring bespoke components, converting valuable experimental time into time spent on manufacturing and calibration. Necessary equipment causes further issues of yield since flask-based batch reactors lack a fresh supply of reactant, causing reaction efficiencies that decay over time.

Analytical is pleased to offer a solution in the form of a standardized flow electrolysis setup. This new and upcoming technology allows for rapid and efficient production of complex chemical compounds via flow electrolysis. With an interelectrode gap smaller than a millimeter, and the introduction of flow geometries that promote turbulent mixing, our Flow Electrolysis Cell allows for heightened selectivity and yield when compared to flask based reactors. Additionally, the Flow Electrolysis Cell requires minimal new equipment to use. With fittings for 1/8" OD HPLC tubing, fluid flow and protruding electrodes can be connected to power supplies via standard connectors will automatically be varied based on the changing electrical conditions as the reaction progresses.



Divided Cell (dual stream)

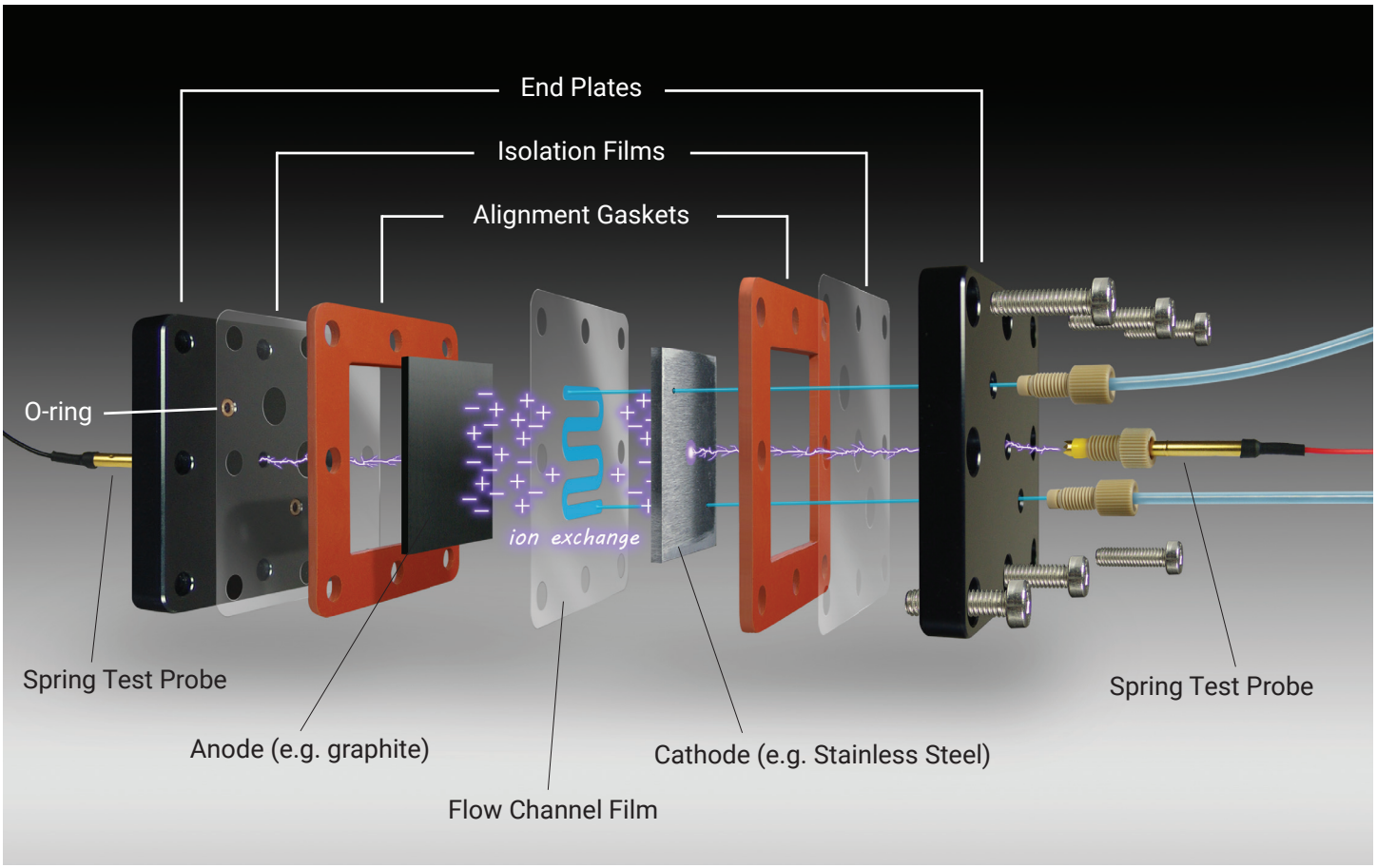


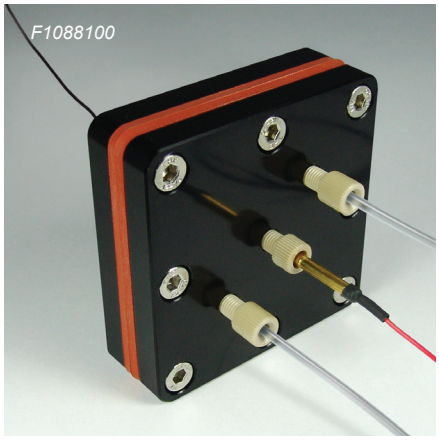
Analytical offers both a **divided** and **undivided** cell. This capability opens up new experimental possibilities and allows swift development of novel and useful compounds, particularly in the field of organic electrosynthesis.

See inside

Undivided Cell (single stream)

In an undivided cell, both electrodes are washed with the same electrolyte and only one fluid circuit is used; the opposite side of the cell is sealed with HPLC plugs and an electrode without through-holes. This allows for low-resistance reactions which will output combined products.





Flow Electrolysis Undivided Cell (single stream) Assembly

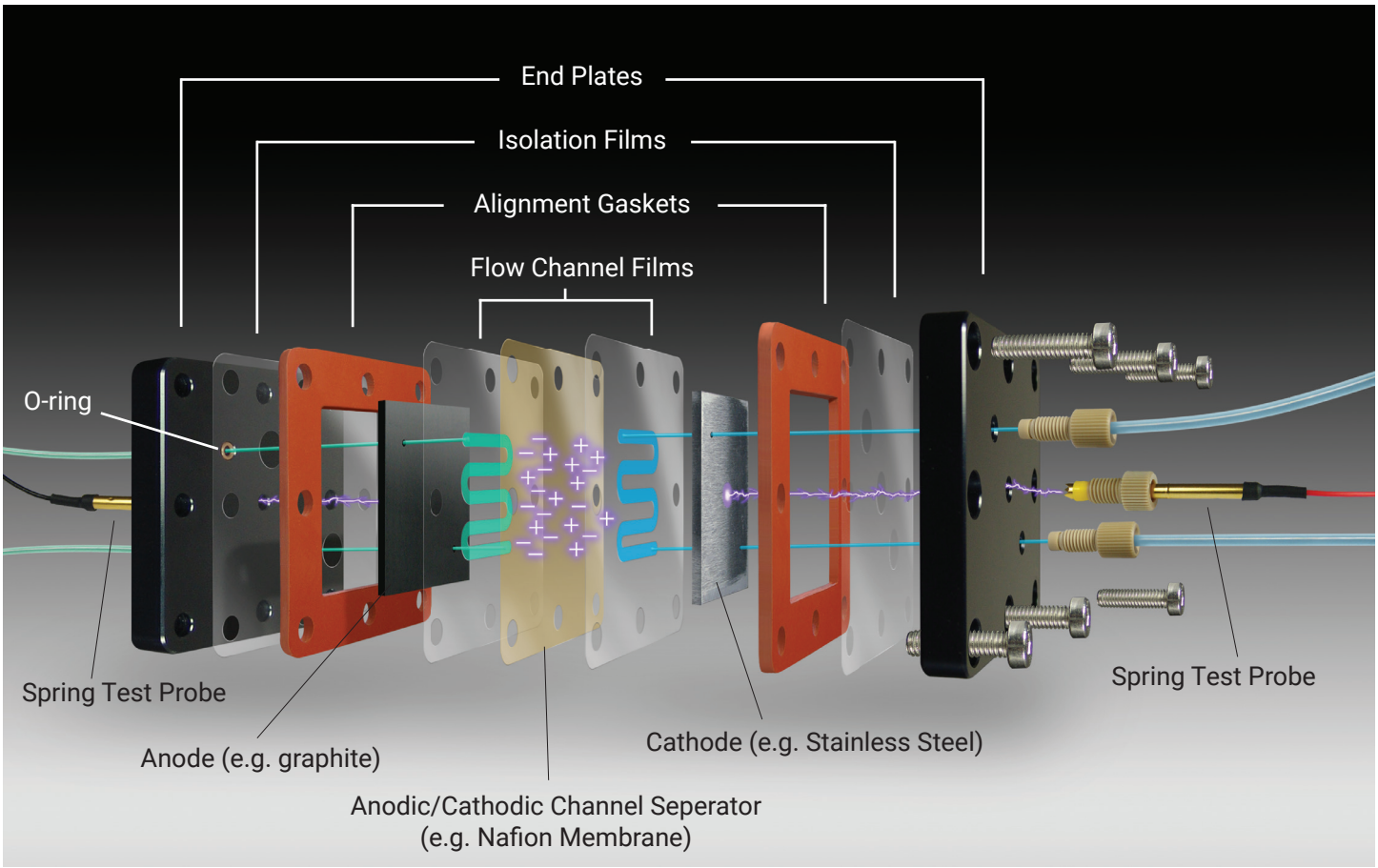
Assembly includes:

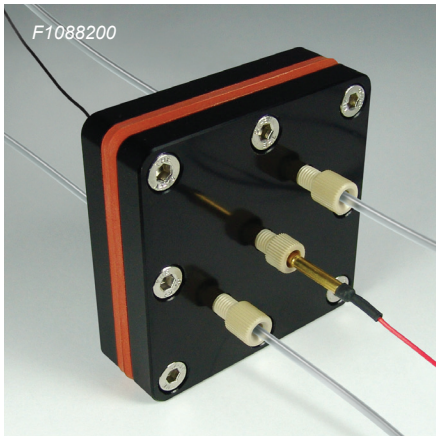
- Impervious Graphite Plate Electrode (anode)
- 316L Stainless Steel Plate Electrode (cathode)
- Flow Channel PFA Films (1 Meandering, 1 Tangential, 1 Simple, 1 Fin Separator)
- Isolation Layer PFA Films (2)
- Orange Silicone Rubber Alignment Gaskets (2)
- Viton™ Chemical-resistant Internal O-rings, 2mm ID (2)
- Viton™ Chemical-resistant External O-rings, 3mm ID (2)
- Spring Test Probes/Pogo Pins (1 red, 1 black)
- Aluminum End Plates (2)
- Fittings and Hardware

Cat. No.	Description	Qty
F1088100	Flow Electrolysis Undivided Cell Assembly (single stream)	Each

Divided Cell (dual stream)

In a divided cell the electrodes and their flow channels are separated by a Nafion membrane, allowing for reactions to be performed that produce separate output streams. This can be advantageous if the two electrolyte solutions are incompatible or if the products of their reaction are troublesome to separate.





Flow Electrolysis Divided Cell (dual stream) Assembly

Assembly includes:

- Impervious Graphite Plate Electrode with holes (anode)
- 316L Stainless Steel Plate Electrode (cathode)
- Flow Channel PFA Films (2 Meandering, 2 Tangential, 2 Simple, 2 Fin separator)
- Isolation Layer PFA Films (2)
- Nafion Ion Exchange Channel Separator Membrane
- Orange Silicone Rubber Alignment Gaskets (2)
- Viton Chemical-resistant Internal O-rings, 2mm ID (4)
- Viton Chemical-resistant External O-rings, 3mm ID (4)
- Spring Test Probes/Pogo Pins (1 red, 1 black)
- Aluminum End Plates (2)
- Fittings and Hardware

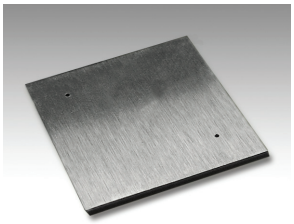
Cat. No.	Description	Qty
F1088200	Flow Electrolysis Divided Cell Assembly (dual stream)	Each

Individual components are also offered, making it easy to convert a divided cell to an undivided cell and vice versa. Higher efficiency and the ability to customize is critical to your experimental needs which is why Analytical offers a variety of different electrodes and flow channels.

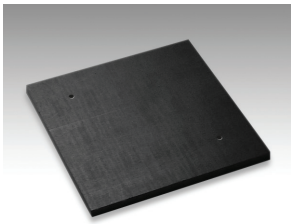
With mixing geometry flow channels designed to promote chaotic mixing and turbulence, the improvement of mass transfer to increase average yield by over 6%, and the convenient 80mm footprint, Analytical has the products required to meet your scientific needs.

Electrode Plates for Flow Electrolysis Cells

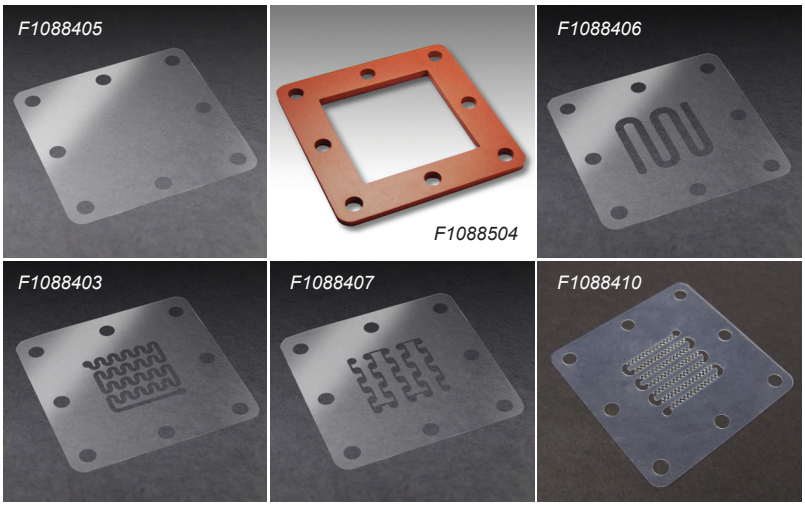
Cat. No.	Description	Qty
F1088109	316L Stainless Steel Plate Electrode (cathode)	Each
F1088119	Titanium Electrode (cathode)	Each
F1088108	Impervious Graphite Plate Electrode (anode)	Each
F1088208	Impervious Graphite Plate Electrode (anode) with Holes	Each



F1088109

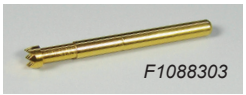


F1088208



Flow Electrolysis Consumable Accessories

Cat. No.	Description	Qty
F1088405	PFA Isolation Layer Films	25
F1088504	Silicone Rubber Alignment Gaskets	10
F1088406	PFA Simple Channel Films	25
F1088403	PFA Meandering Channel Films	25
F1088407	PFA Tangential Mixer Channel Films	25
F1088410	PFA Fin Separator Channel Films	25
F1088201	Nafion Ion Exchange Channel Separator	Each
F1088302	Viton Chemical-resistant External O-rings	50
F1088301	Viton Chemical-resistant Internal O-rings	50
F1088303	Spring Test Probes / Pogo Pins	10



F1088303

Flow Electrolysis Power Supply

Cat. No.	Description	Qty
F1030050	Flow Electrolysis Power Supply	Each

F1030050

For pricing, see analytical-sales.com

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