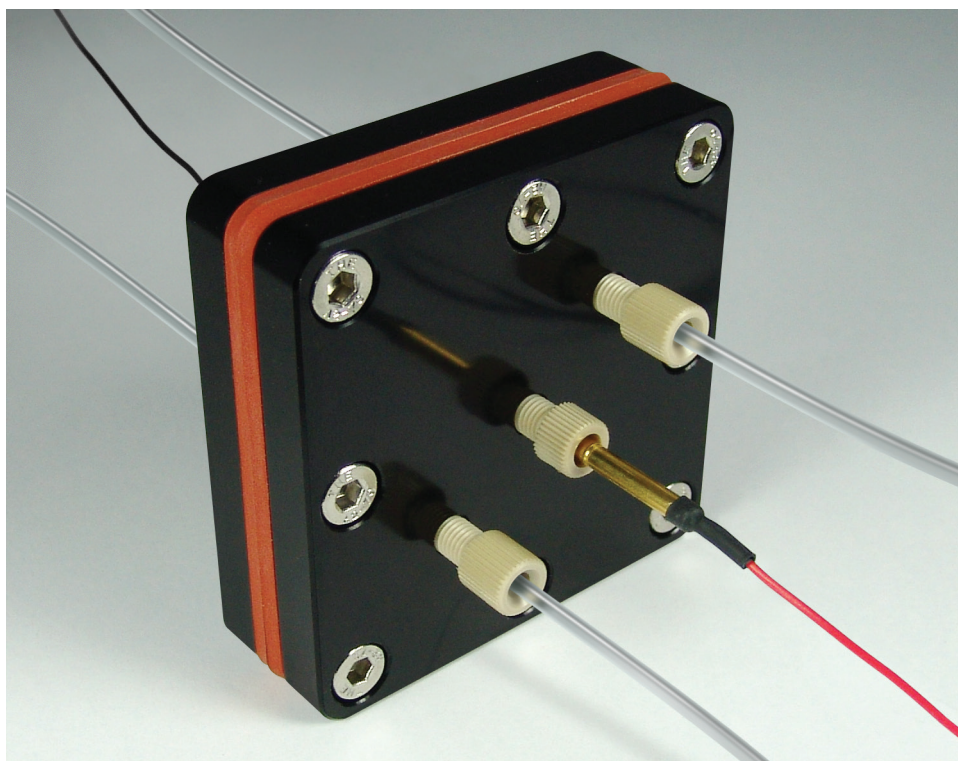


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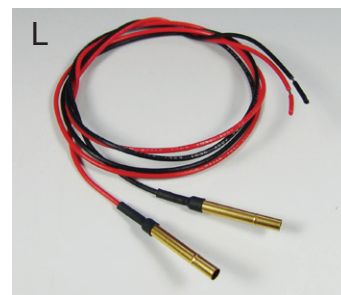
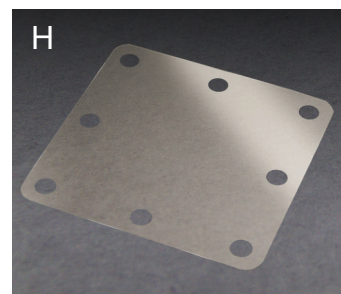
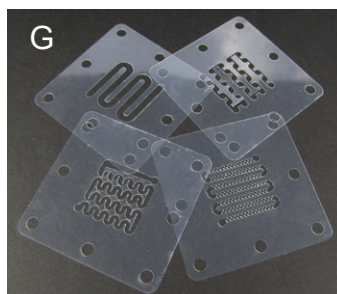
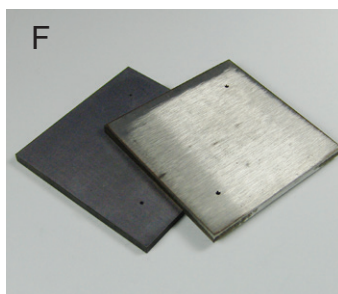
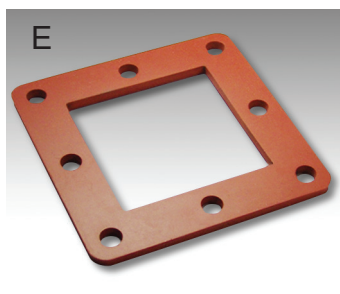
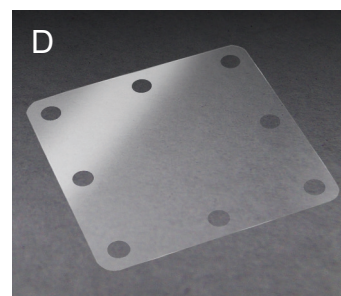
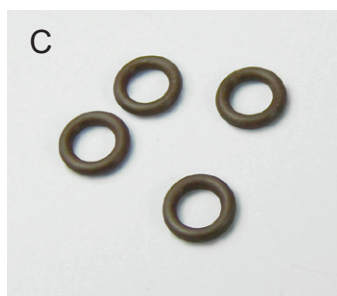
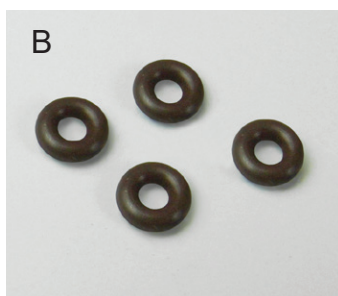
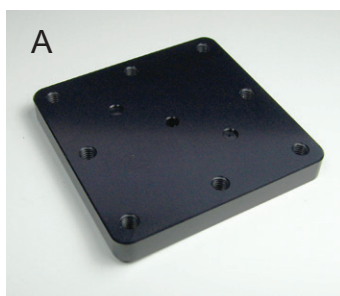


Flow Electrolysis

Assembly and Setup

Revision 2a - 09/01/2023

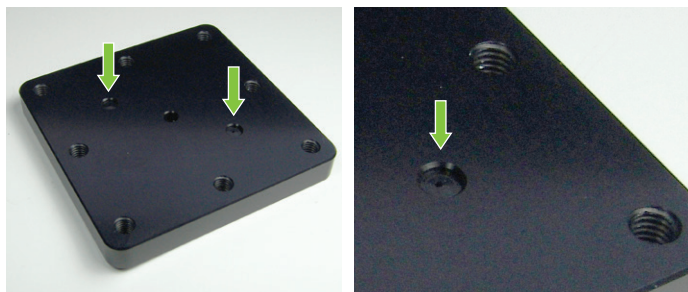
Divided Cell Setup



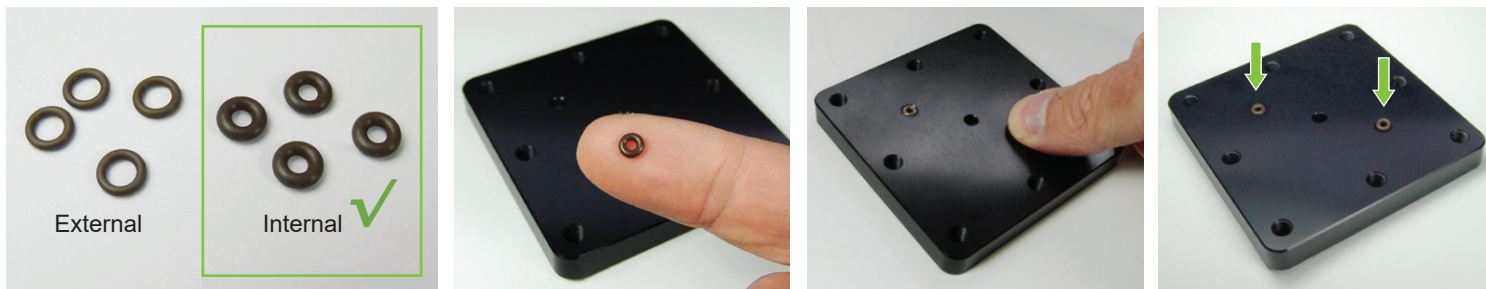
Before starting your Flow Electrolysis Cell assembly, make sure you have all components gathered and ready:

- | | |
|---|---|
| A. F1088101 - Base End Plate | G. Flow Channel Films (2) - (4 sets of 2 are provided) |
| B. F1088301 - Viton Chemical-resistant Internal O-rings (4) | H. F1088201 - Nafion Ion Exchange Channel Separator (1) |
| C. F1088302 - Viton Chemical-resistant External O-rings (4) | I. F1088102 - Lid End Plate |
| D. F1088405 - 0.010" PFA Isolation Layer Films (2) | J. Screws (8) |
| E. F1088504 - Silicone Rubber Alignment Gaskets (2) | K. F1088303 - Spring Test Probes / Pogo Pins (2) |
| F. Electrodes (1 graphite, 1 stainless steel) | L. F1088304 - Connection Sockets for Spring Test Probes (2) |

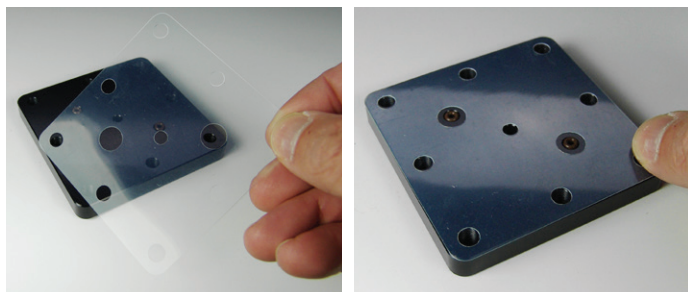
• Fittings also provided



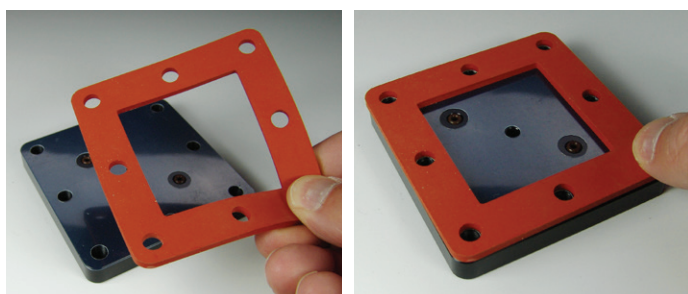
1. Place the Base End Plate (black aluminum with *threaded* holes) on a flat working surface. Make sure that the side with the shallow non-threaded diagonally positioned holes are facing up.



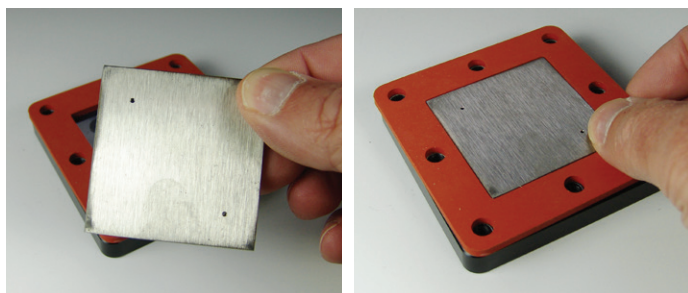
2. Insert two internal o-rings (F1088301) into the shallow non-threaded diagonally positioned holes.



3. Place one 0.010" PFA Isolation Layer Film (F1088405) on top of the base plate. Make sure that all holes on the Isolation Layer are aligned with those of the base plate.

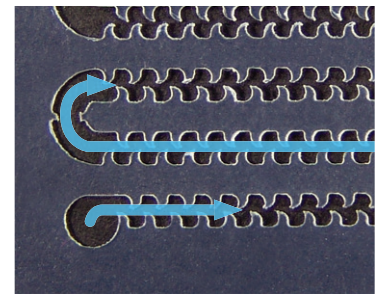
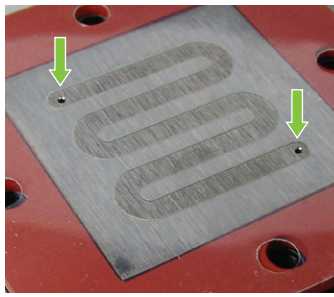
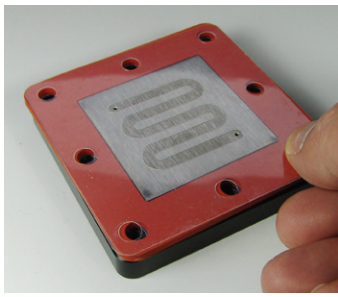


4. Place one silicone gasket (F1088504) on top of the Base Plate and Isolation Layer Film.



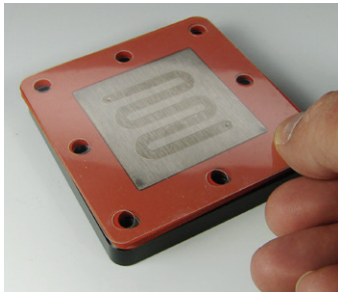
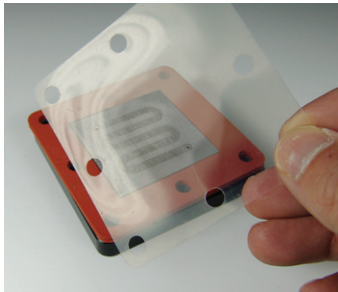
5. Insert one electrode into the middle space of the silicone gasket. Make sure that the small diagonal holes in the electrode match the positions of the holes in the base plate and isolation layer.

Note: Clean the electrodes before assembly to ensure optimal reaction results.

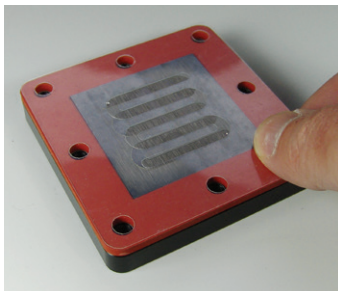
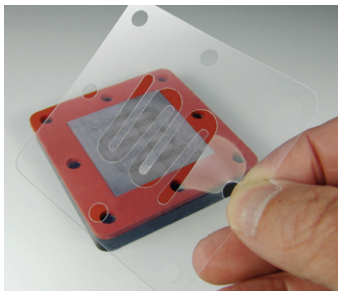


6. Choose a Flow Channel Film set from the 4 sets provided (F1088407, F1088403, F1088410, or F1088406). Place one flow channel film on top of the silicone gasket/electrode. **IMPORTANT:** Make sure that the beginning and end of the flow channel line up with the flow holes in the base plate/isolation layer/ electrode.

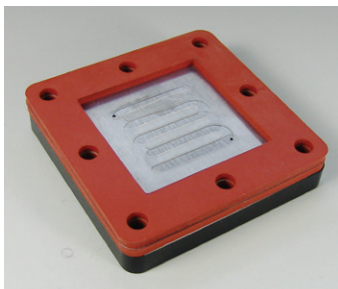
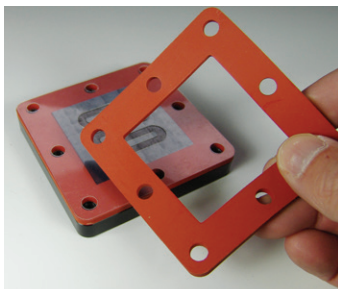
Note: If using F1088410, ensure that the flow channel is oriented so that the fins are pointing into the path of the fluid (see diagram).



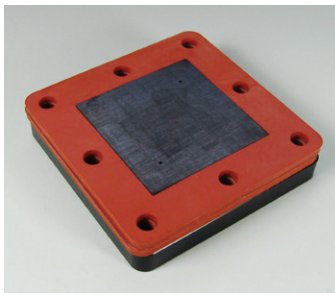
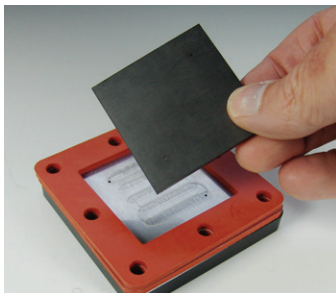
7. Add the nafion ion exchange transfer material (F1088201) on top of the flow channel. Ensure that the eight large holes on the sides line up with the those below it.



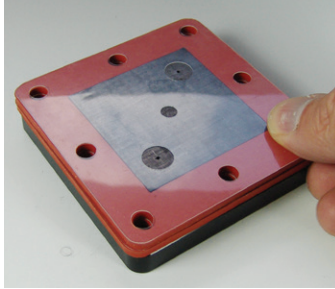
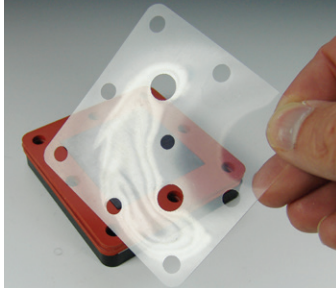
8. Place the second flow channel film (from set of 2) on top of the ion exchange film.



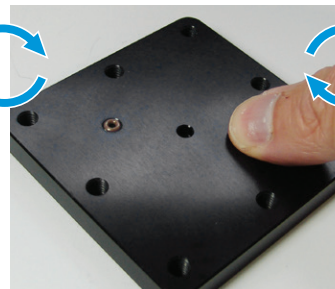
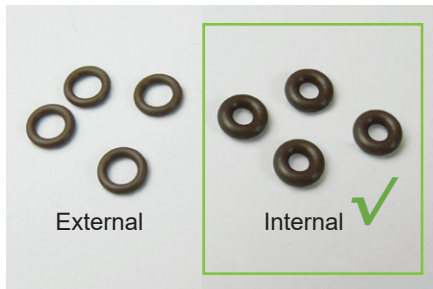
9. Add the second silicone rubber gasket.



10. Insert the second electrode, making sure that the holes line up with the beginning and end of the second flow channel (alignment with flow holes of previous layers not necessary).

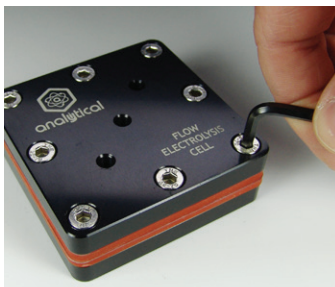
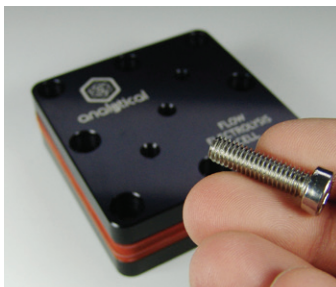


11. Add the second isolation layer, making sure that the holes line up with the holes of the second electrode.



12. Find the Lid End Plate. Insert two internal o-rings (F1088301) into the shallow unthreaded diagonal holes (in the side of the plate opposite the logo engraving). Place the Lid End Plate with o-rings on top of the assembled stack, making sure that flow holes are lined up.

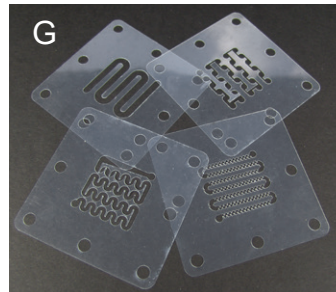
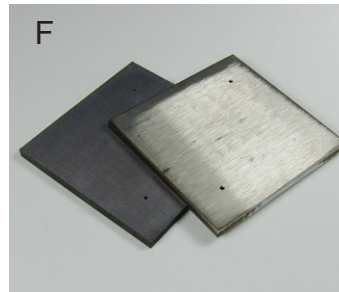
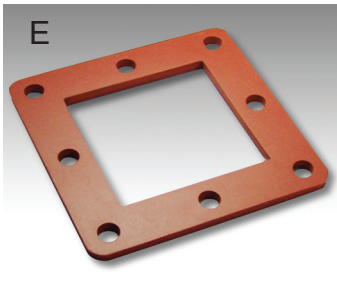
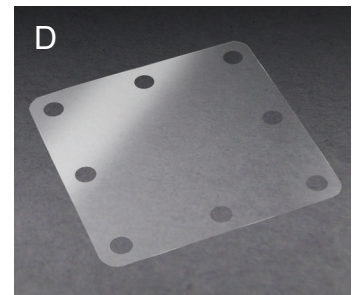
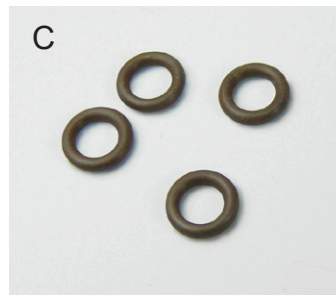
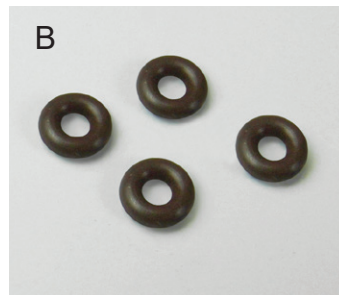
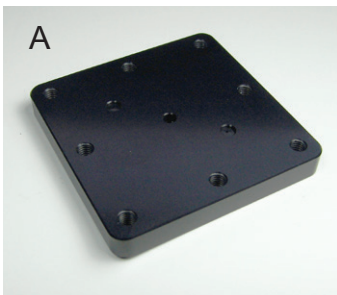
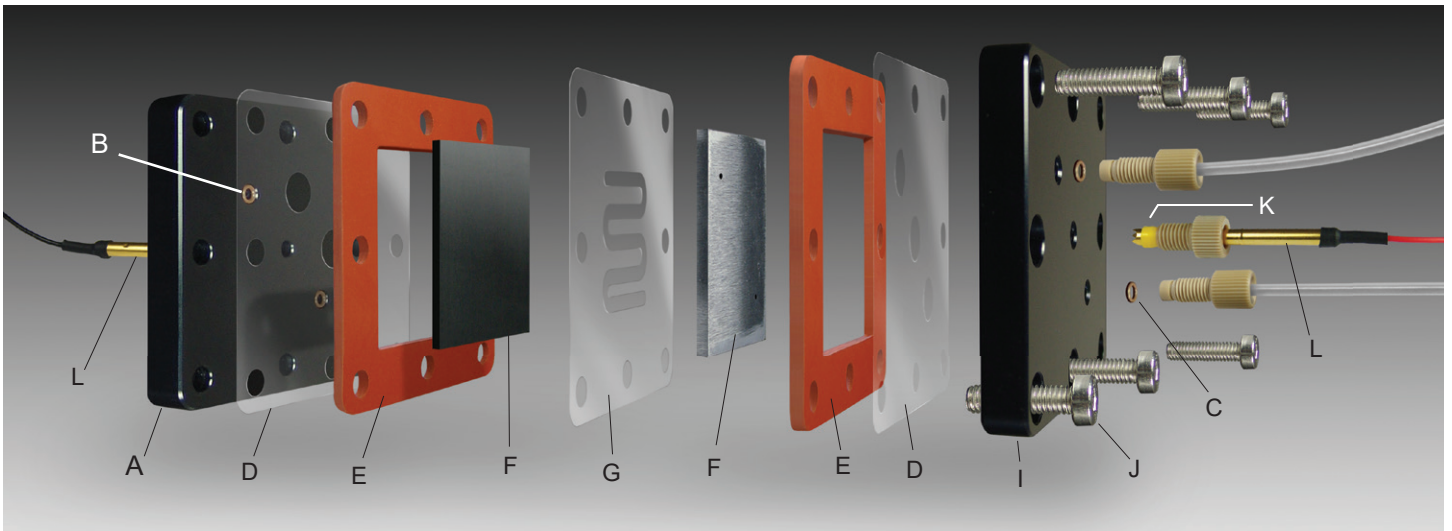
Tip: use your thumb or finger to press the o-rings into the holes. This will help keep them in place when placing the lid plate onto the assembly.



13. Insert 8 M6 screws through the holes of the lid plate and those of the layers beneath it, then screw them into the bottom plate with an allen wrench.

You are now ready for setup - proceed to page 10.

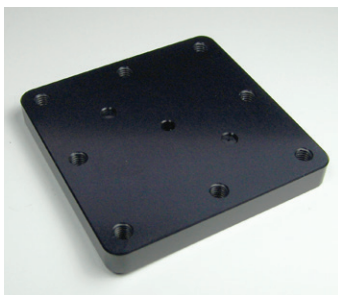
Undivided Cell Setup



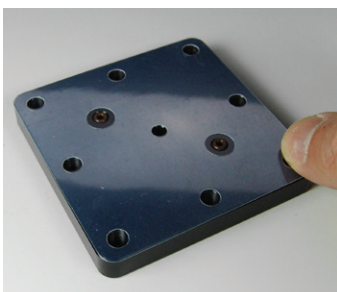
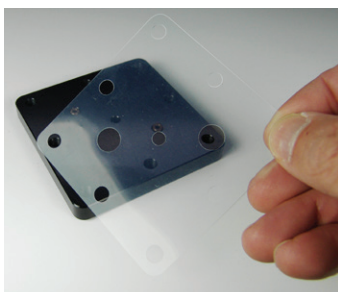
Before starting your Flow Electrolysis Cell assembly, make sure you have all components gathered and ready:

- | | |
|---|---|
| A. F1088101 - Base Plate | G. Flow Channel Films (1 simple, 1 meandering, 1 tangential, 1 fin separator) |
| B. F1088301 - Viton Chemical-resistant Internal O-rings (4) | I. F1088102 - Lid Plate |
| C. F1088302 - Viton Chemical-resistant External O-rings (4) | J. Screws (8) |
| D. F1088405 - 0.010" PFA Isolation Layer Films (2) | K. F1088303 - Spring Test Probes / Pogo Pins (2) |
| E. F1088504 - Silicone Rubber Alignment Gaskets (2) | L. F1088304 - Connection Sockets for Spring Test Probes (2) |
| F. Electrodes (1 graphite, 1 stainless steel) | |

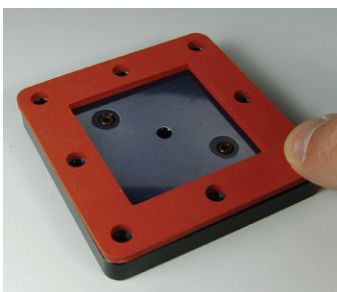
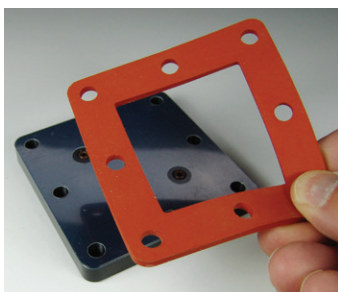
• Fittings and plugs also provided



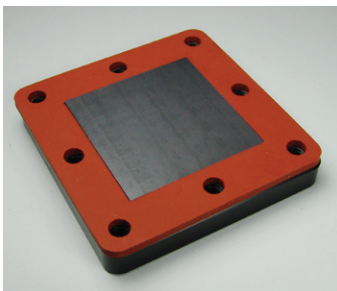
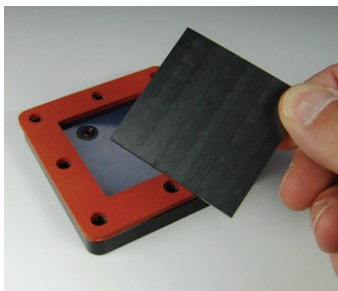
1. Place the Base Plate (black aluminum with *threaded* holes) on a flat working surface. Make sure that the side with the shallow diagonally positioned holes are facing up.



2. Place one 0.010" PFA Isolation Layer Film (F1088405) on top of the base plate. Make sure that all holes on the Isolation Layer are aligned with those of the base plate.

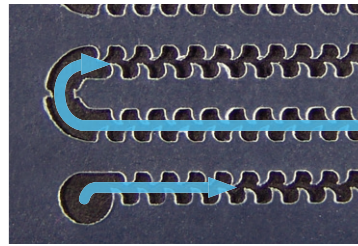
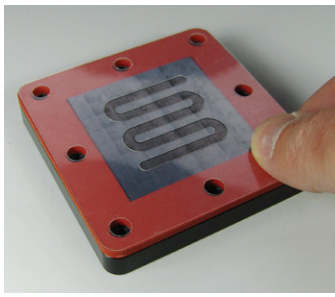
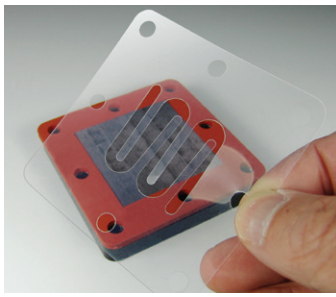


3. Place one silicone gasket (F1088504) on top of the Base Plate and Isolation Layer Film.



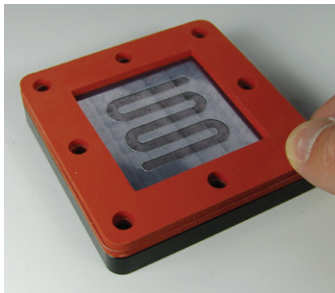
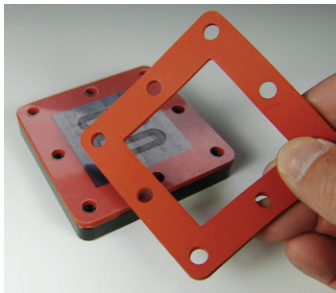
4. Insert the graphite electrode (with no holes) into the middle space of the silicone gasket.

Note: Clean the electrodes before assembly to ensure optimal reaction results.

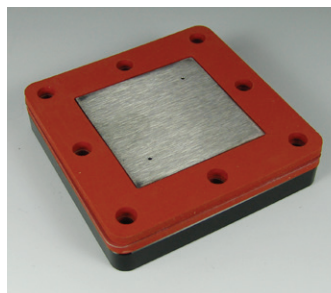
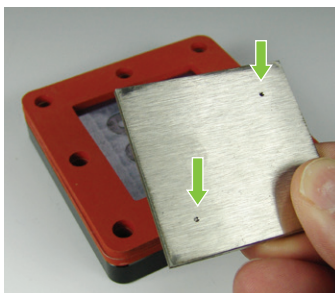
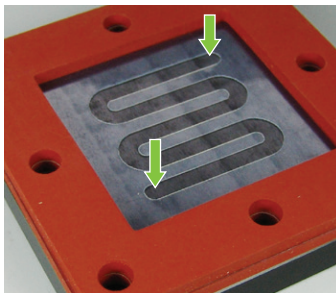


Note: If using F1088410, ensure that the flow channel is oriented so that the fins are pointing into the path of the fluid (see diagram).

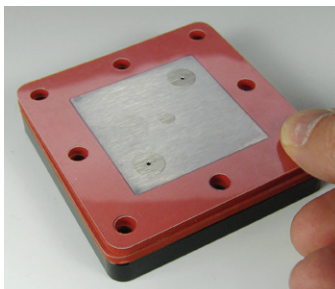
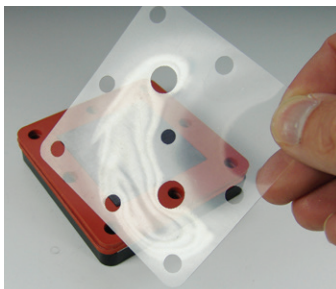
5. Choose a Flow Channel Film from the 4 provided (F1088407, F1088403, F1088410, or F1088406). Place the flow channel film on top of the silicone gasket/electrode.



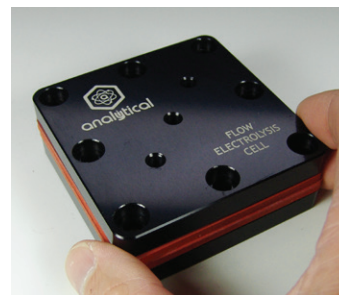
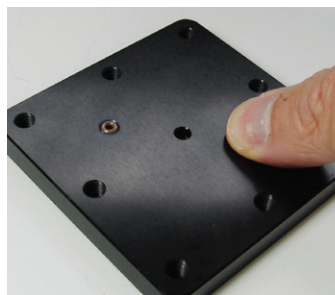
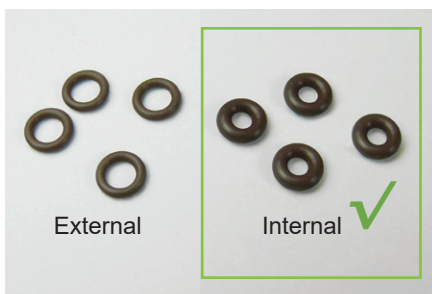
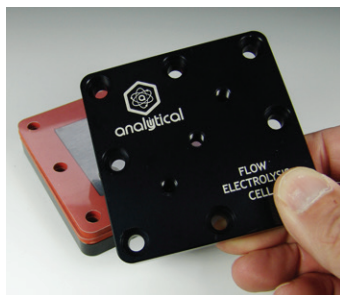
6. Place the second silicone gasket on top of the flow channel film.



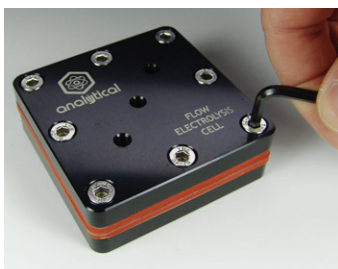
7. Insert the stainless steel electrode (with holes) into the middle space of the silicone gasket. **IMPORTANT:** Make sure that the holes in the electrode line up with the beginning and end of the flow channel.



8. Place the second isolation layer film on top. **IMPORTANT:** Make sure that the holes in the isolation layer line up with the holes in the Stainless Steel electrode. Do not add a second flow channel.



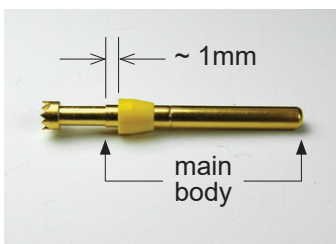
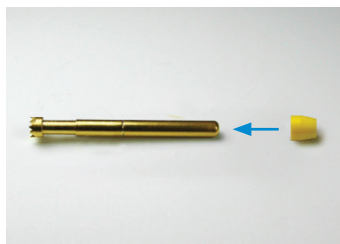
9. Find the Lid Plate. Insert two internal o-rings (F1088301) into the shallow unthreaded diagonal holes (in the side of the plate opposite the logo engraving). Place the Lid Plate with o-rings on top of the assembled stack, making sure that flow holes are lined up. **Tip:** use your thumb or finger to press the o-rings into the holes. This will help keep them in place when placing the lid plate onto the assembly.



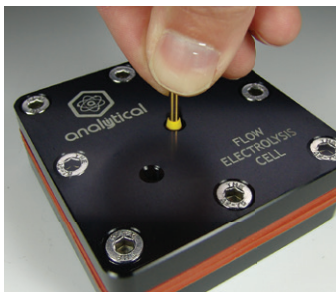
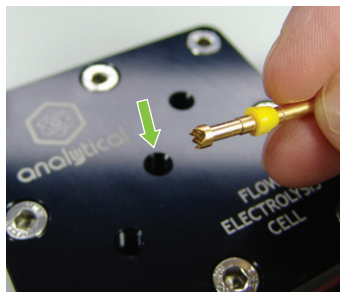
10. Insert 8 M6 screws through the holes of the lid plate and the layers beneath it, then screw them into the bottom plate with an allen wrench.

You are now ready for setup - proceed to page 10.

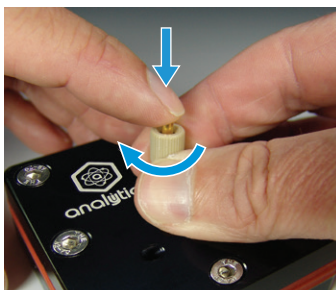
Experimentation Setup



1. Slide a yellow ferrule onto a spring test probe (F1088304) until the end of the ferrule is about 1mm from the end of the main body of the pin (before the move-able spring part). The taper of the ferrule should be facing away from the movable part of the spring pin.



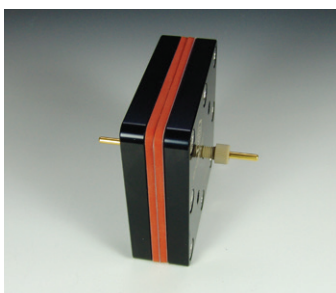
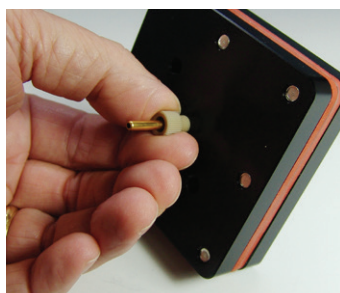
2. With the flow electrolysis cell fully assembled, gently place the pogo pin / ferrule assembly into the center hole of the end plate. Ensure that the spiked head of the pogo has is making contact with the electrode.



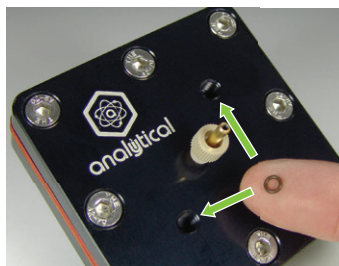
3. Slide a fitting around the pogo pin. With the fitting held free, press the top of the pogo pin down so that it bottoms out on the electrode and then begin twisting the fitting. Continue to press on the top of the pogo pin until the fitting is tight on the ferrule.



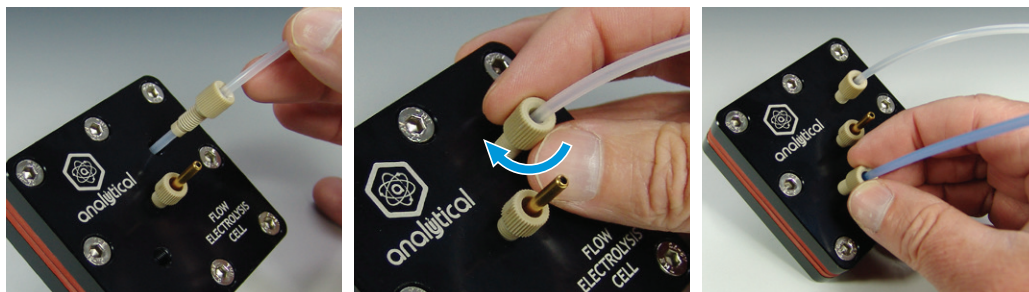
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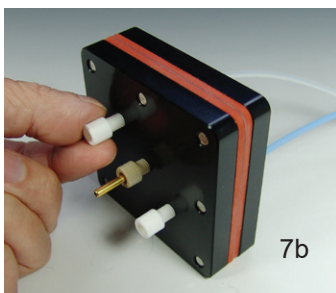
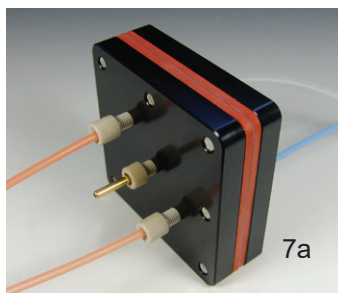
4. Repeat steps 1-3 for the opposite side of the electrolysis cell assembly.



5. Insert the external o-rings (F1088302) into the deep diagonally positioned holes in the Lid and Base End Plates. These are where the fluid connections will be made.



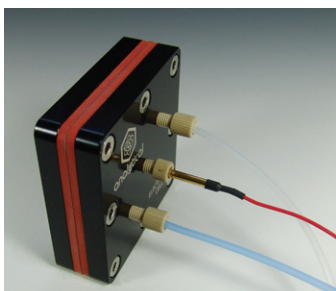
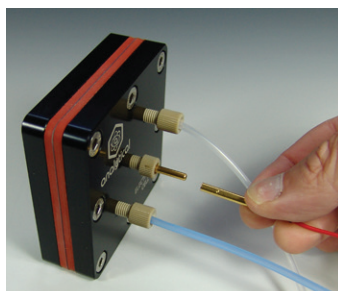
6. Install the fluid connections. Start by inserting a capillary tube into the ID of an external o-ring (F1088302) seated inside a diagonally positioned hole on the lid plate. The capillary should remain within the ID of the o-ring while a ferrule and fitting are tightened to ensure a firm fluid connection. Add another capillary tube to the other hole with o-ring on the lid plate.



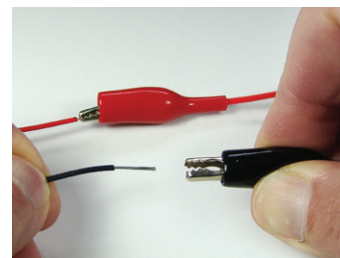
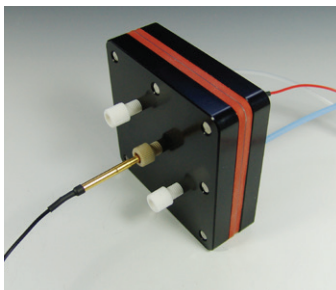
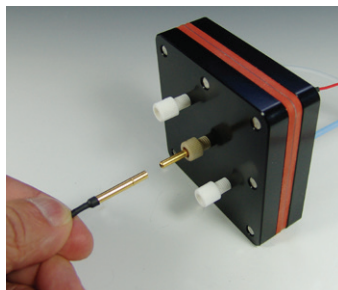
7a. For the Divided Cell, repeat the fluid connection (step 6) on the opposite side of the assembly to allow for both flow paths to receive electrolyte.

7b. For the Undivided Cell, use plugs to seal up the opposite side fluid connection holes.

Connect the other end of the capillaries to a pump.

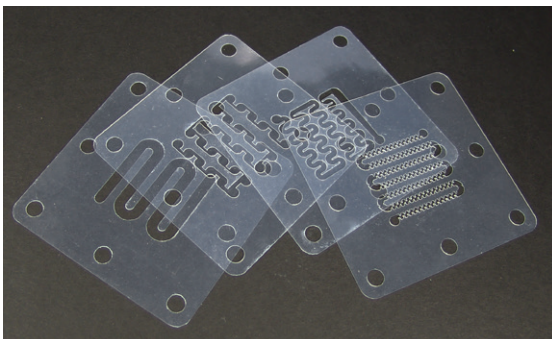
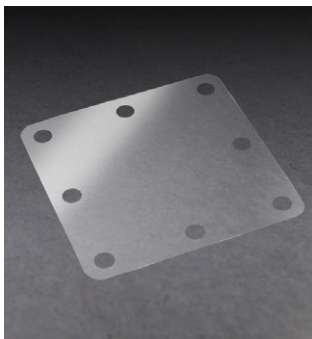


8. Attach the Connection Sockets (F1088304) to the pogo pins. Then, clamp the alligator clips of the Power Supply Cable (F1030051, supplied with power supply, sold separately) onto the uninsulated ends of the Solder Connection Sockets wires. Connect the power supply cable to the Power Supply (F1030050).



Note: With the pump on, the system can be run in CC or CV by adjusting the power supply as needed.

After the reaction has concluded, add internal standard solution, or workup your reactions as needed. Analysis can be conducted by UHPLC, HPLC, GC, NMR or isolation depending on the particular use case.



Each Flow Electrolysis unit comes with 0.010" PFA Isolation Layer Films and Flow Channel Films. For users wishing to further minimize the interelectrode gap, .005" films are also available. Call or go to our website for more information.



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Contact Info:

Analytical Sales and Services, Inc.

179 US 206 South

Flanders, NJ 07836

(973) 616-0700

info@analytical-sales.com