Chemistry—Methods

Supporting Information

Development and Assembly of a Flow Cell for Single-Pass Continuous Electroorganic Synthesis Using Laser-Cut Components

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Supporting Information

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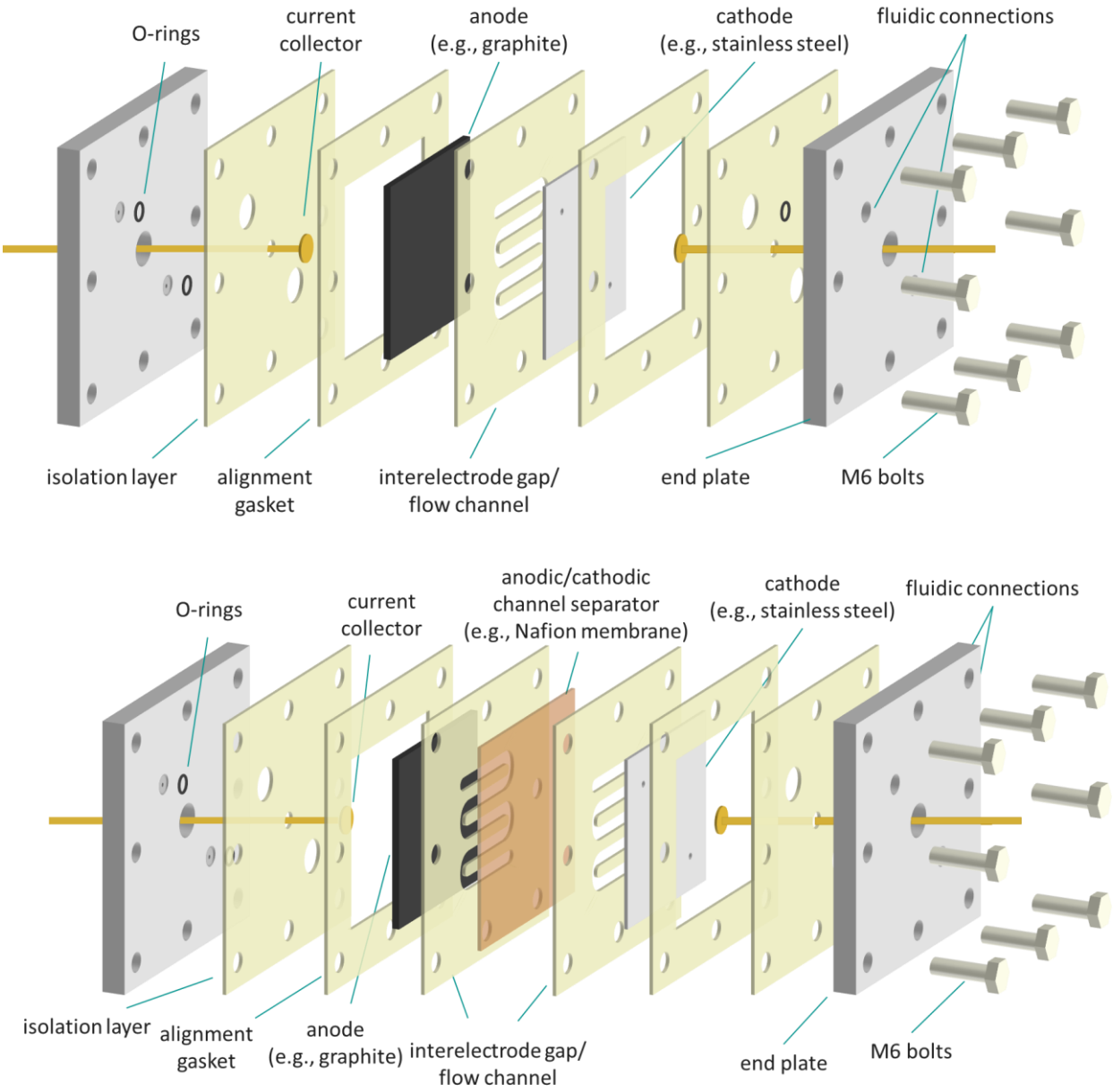


Figure S1. Exploded view of the assembly of an undivided cell (top) and a divided cell (bottom).

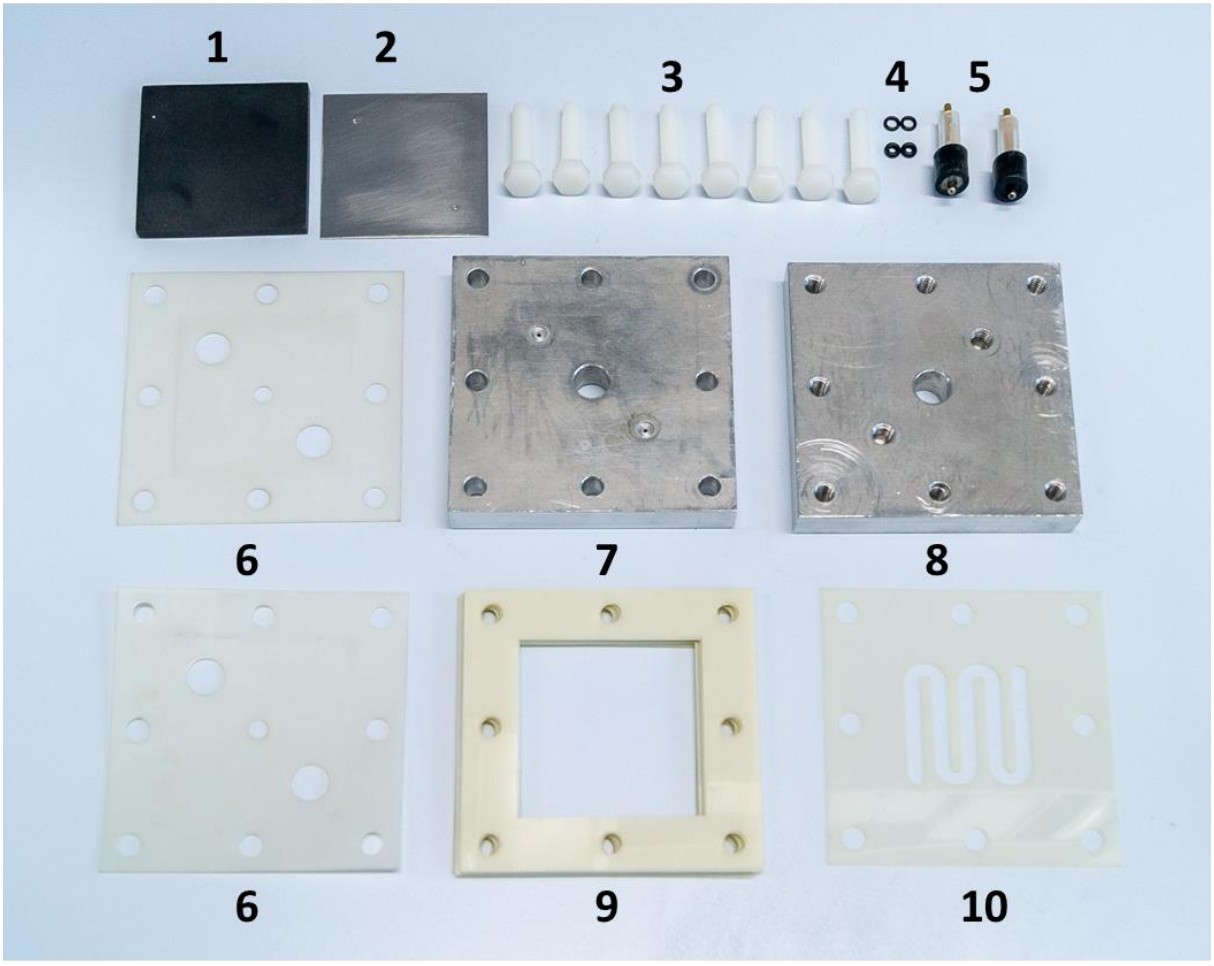
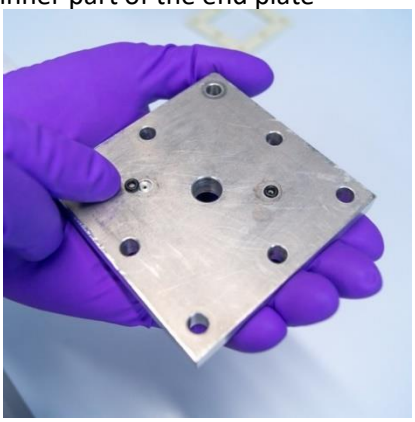


Figure S2. Components of the flow electrolysis cell utilized in this work. **1**: Graphite anode (IG-63, GTD Graphit Technologie GmbH, 50 × 50 × 3 mm). **2**: Stainless steel cathode (Stainless Steel - AISI 316L, Fe/Cr 18%/Ni 10%/Mo 3%, foil, 50 × 50 × 0.1 mm) incorporating two 1 mm holes. **3**: M6 bolts (polyamide, 30 mm, DIN 933). **4**: O-rings: 5 mm o.d./2 mm i.d., EPDM (internal); 5 mm o.d., 3 mm i.d., EPDM (external for fitting connections). **5**: current collectors (pogo-pins 2.6 mm diameter, 35 mm length, PTR 1040-D-1.5N-NI-2.4) in a 10 mm o.d. tubing adaptor. **6**: isolation layer (laser-cut Mylar foil, 0.3 mm thickness). **7**: end plate 1 (no M6 threads, inside view). **8**: end plate 2 (with M6 threads, outer view). **9**: alignment gaskets (laser-cut Mylar foil, 0.3 mm thickness). **10**: electrode separator/reaction channel (laser-cut Mylar foil).

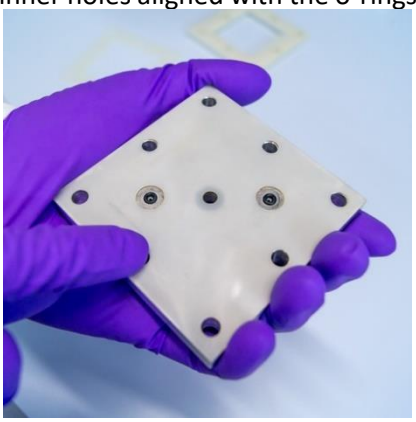
Graphical Instructions for the Assembly of the Flow Electrolysis Cell

Notes: these instructions use the assembly of an undivided cell as example. Technical drawings for all components can be found below; o-rings: 5 mm o.d., 2 mm i.d. for the inner part (between end plate and the electrodes), 5 mm o.d., 3 mm i.d., for the fluidic fittings (optional), material: EPDM, were purchased from Bohemia Seal, s.r.o.; all Mylar films are produced by DuPont and were laser cut by Formulor GmbH. Scalable Vector Graphics (SVG) for the laser-cutting of the films can be downloaded as Supporting Information.

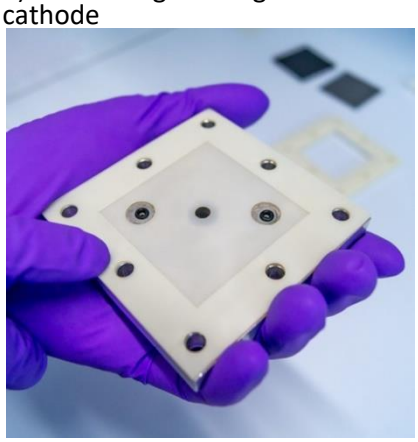
1) Attach the 5x2mm o-rings to the inner part of the end plate



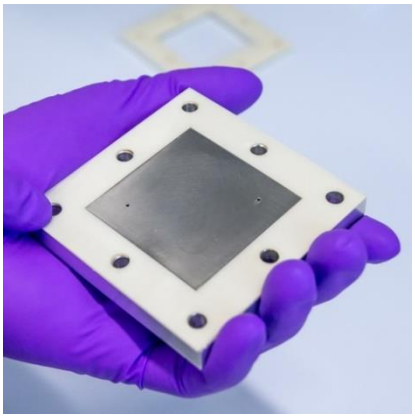
2) Add one isolation layer, with the inner holes aligned with the o-rings



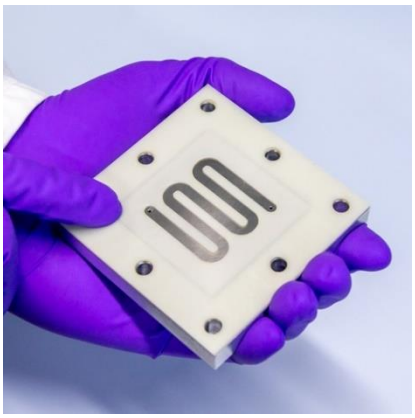
3) Add an alignment gasket for the cathode



4) Add the cathode. Check the alignment of the electrode holes and the o-rings

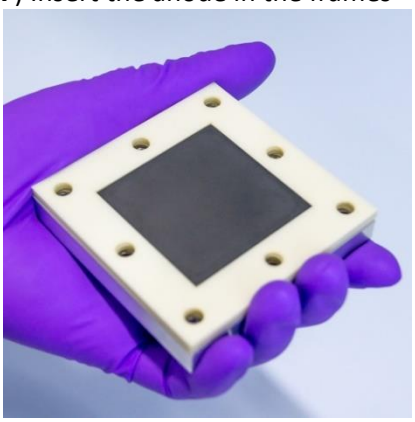


5) Add the electrode separator/reaction channel foil

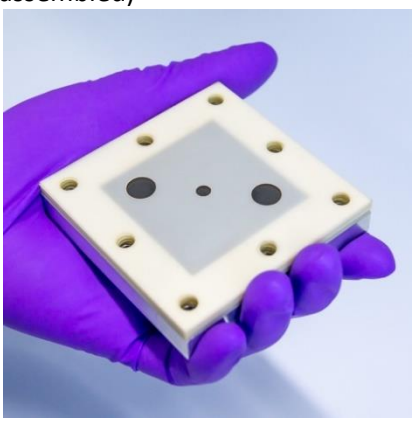


6) Add alignment gaskets. The total thickness should be similar to the electrode thickness. In this case, 10x0.3 mm gaskets were used for a 3 mm thick anode

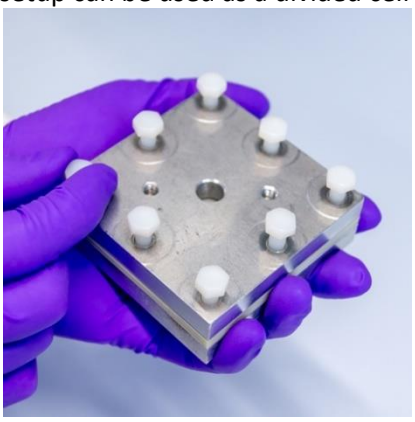
7) Insert the anode in the frames



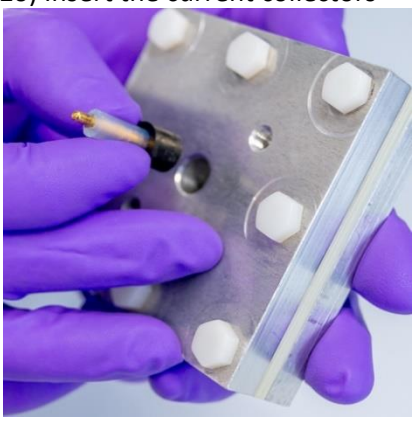
8) Add an isolation layer (this layer also has inner holes, in case an undivided cell needs to be assembled)



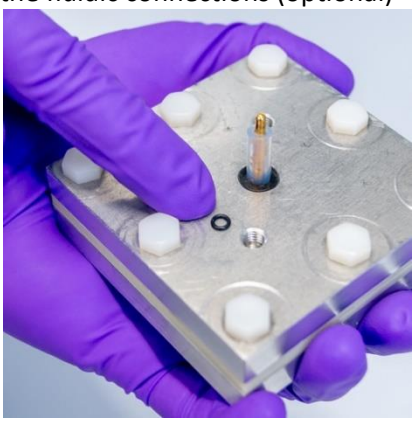
9) Place the second end plate and screw the bolts. This end plate also has fluidic connections, so the setup can be used as a divided cell



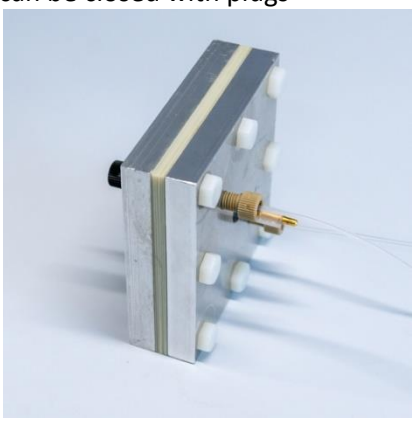
10) Insert the current collectors



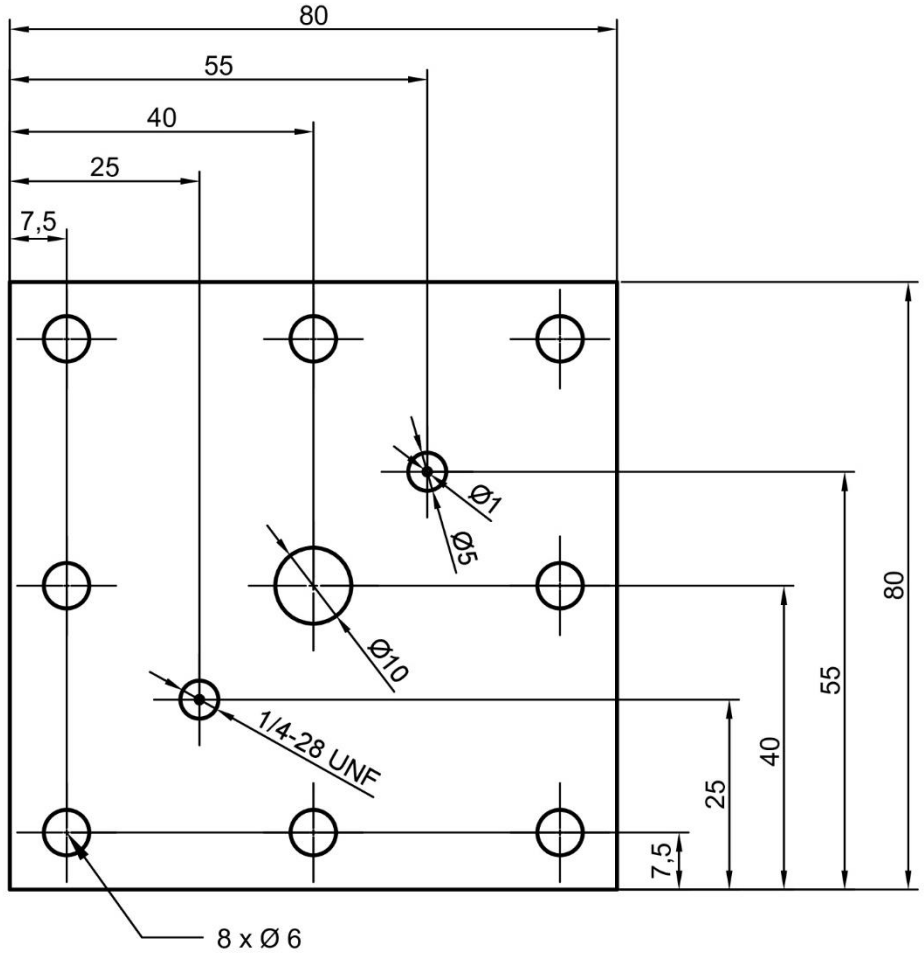
11) Introduce o-rings (5x3 mm) in the fluidic connections (optional)

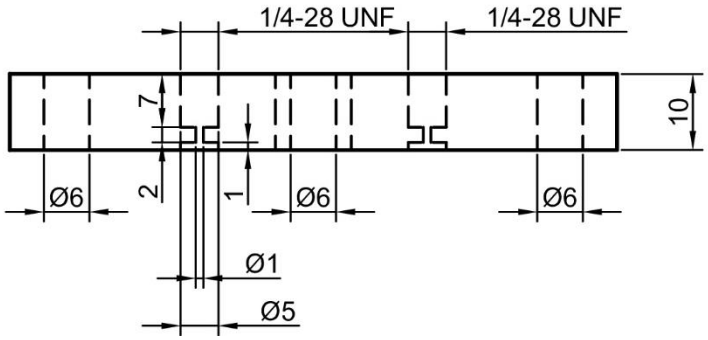


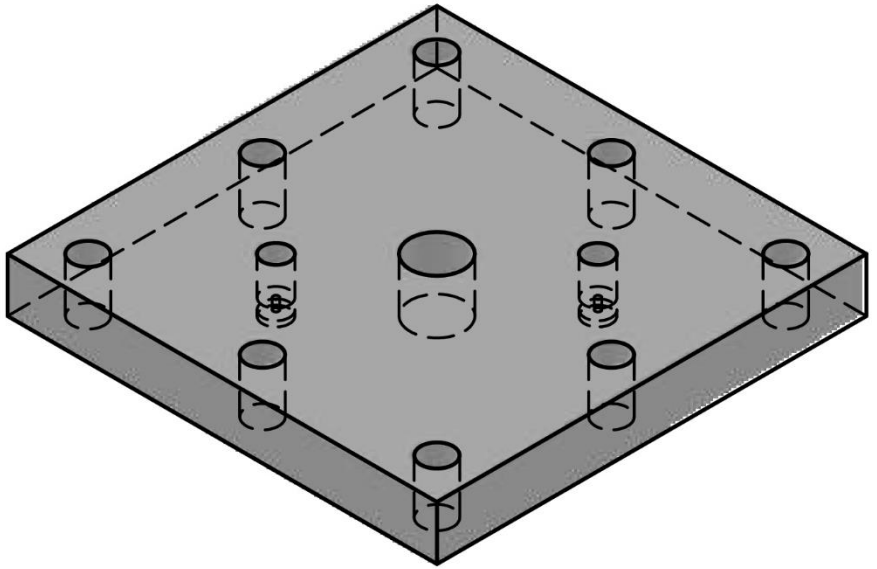
12) Assembled cell. Screw the inlet and outlet tubing connections. In an undivided cell, the fluidic connections in the other end plate can be closed with plugs



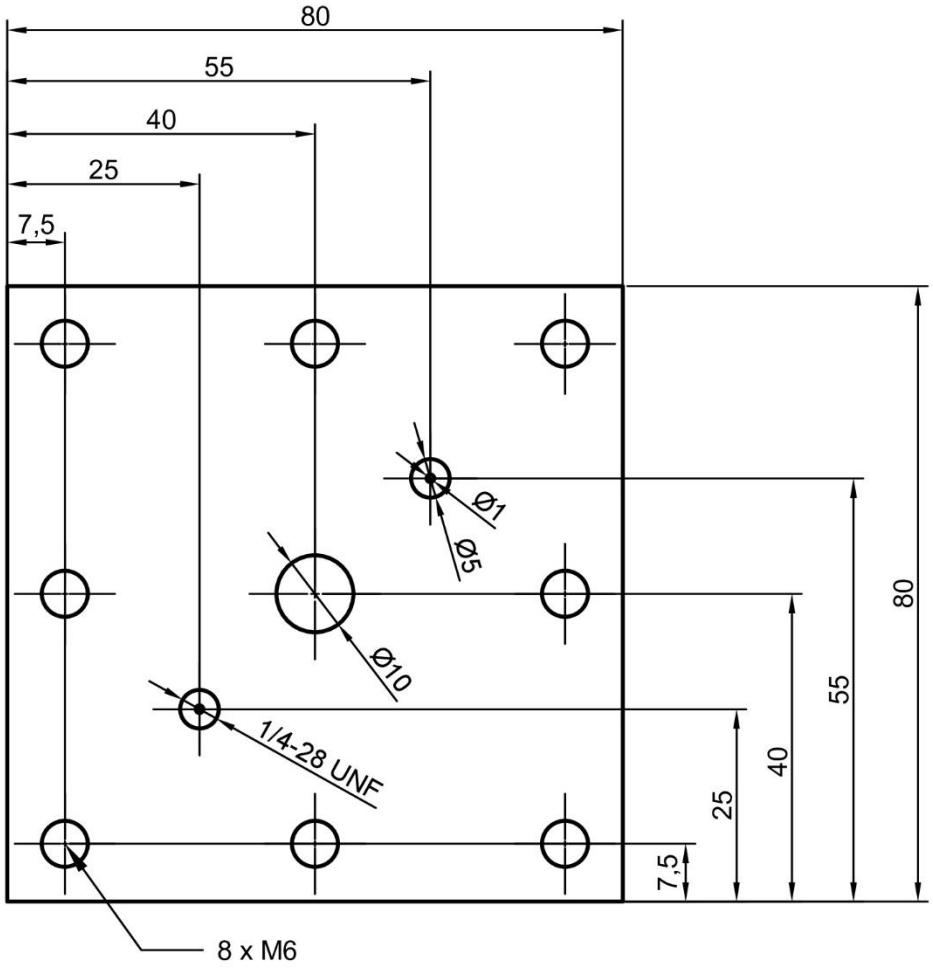
Technical Drawings (Scalable vector graphics – SVG for laser cutting and Autodesk CAD – DWG files can be downloaded as Supporting Information)

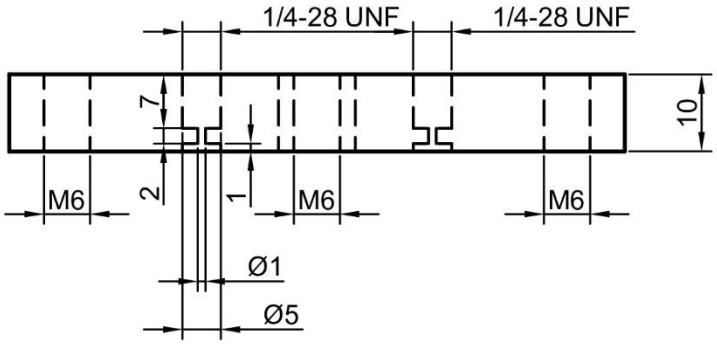


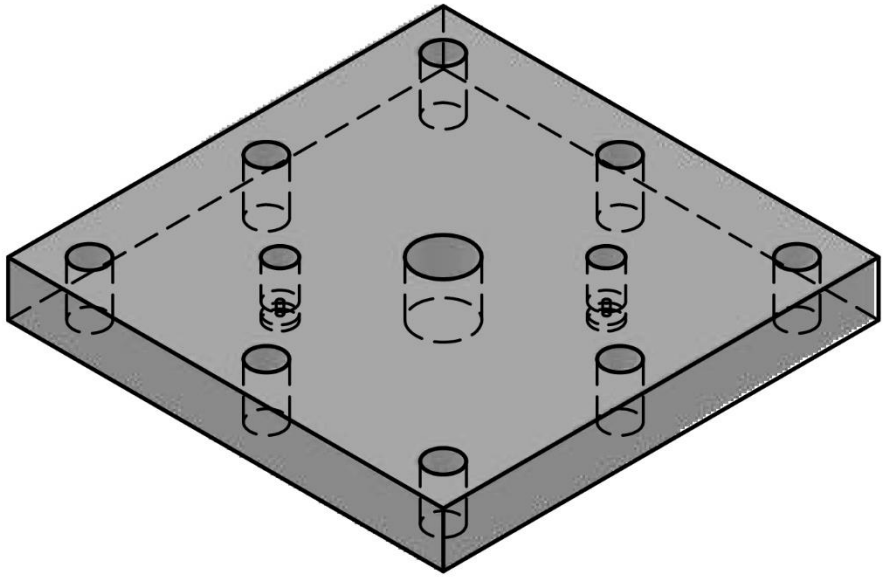




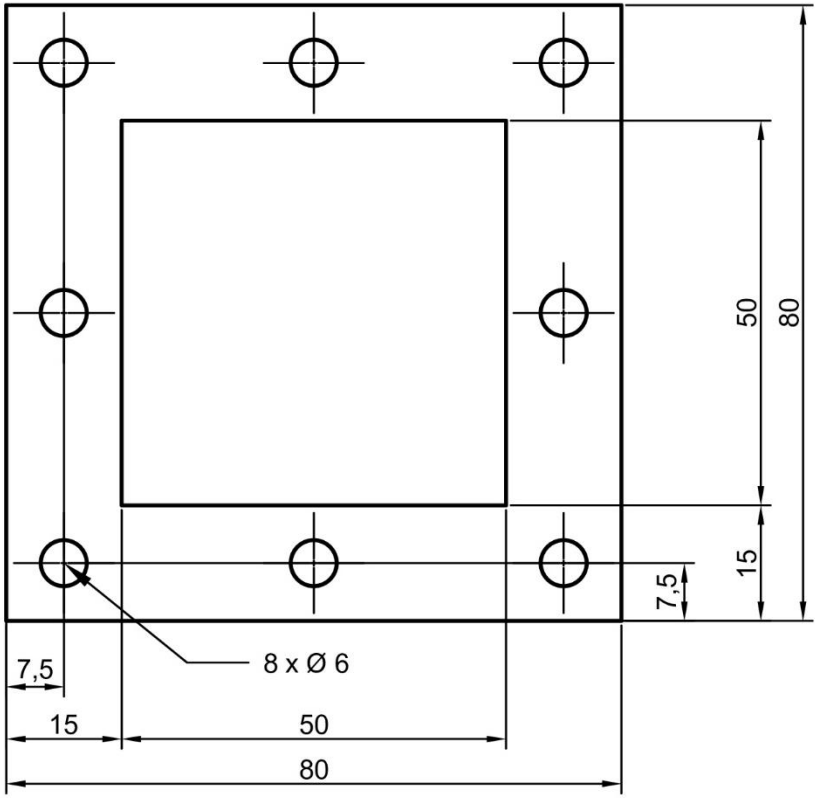
All numbers in mm

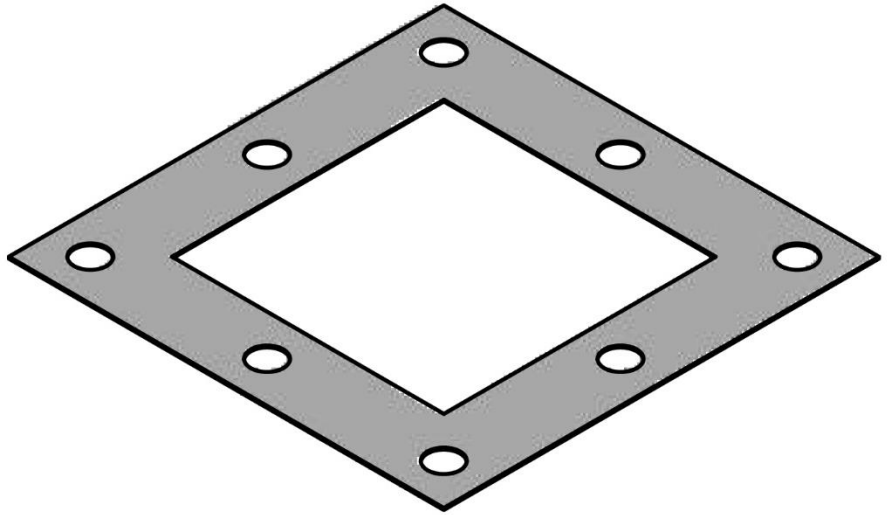




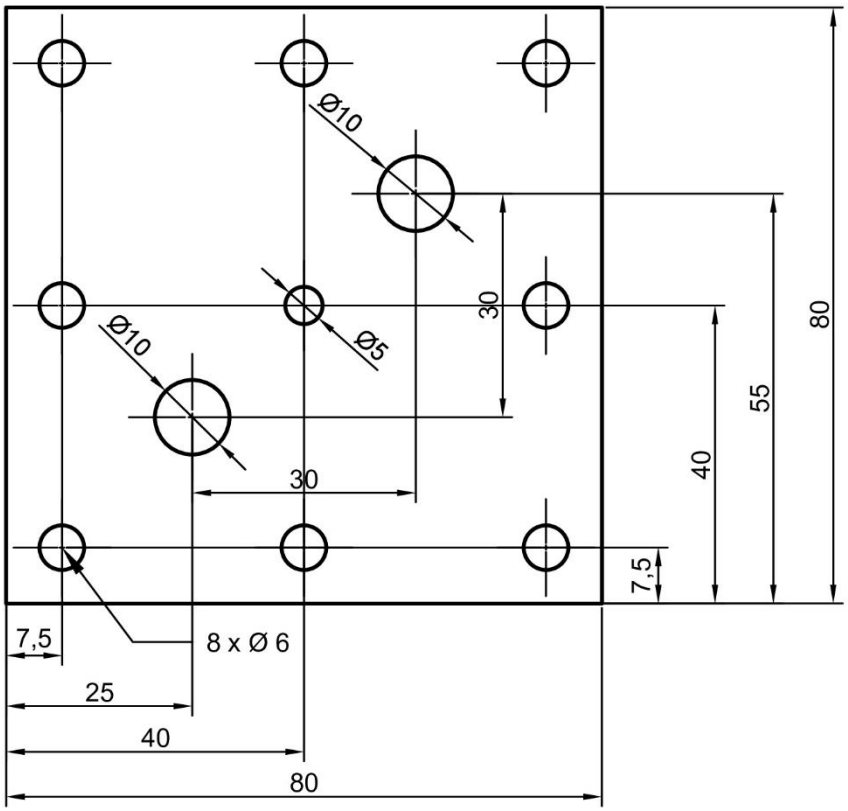


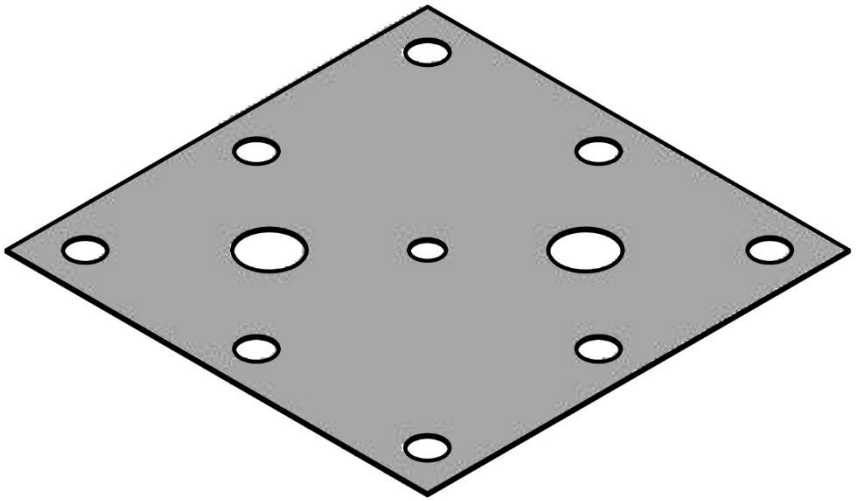
All numbers in mm



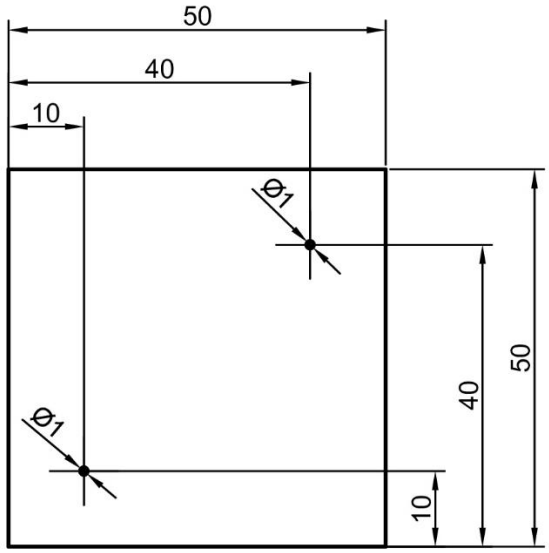


All numbers in mm
thickness: 0,3 mm

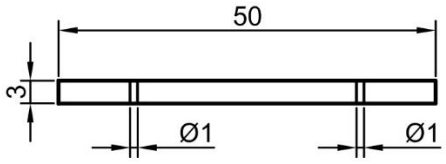


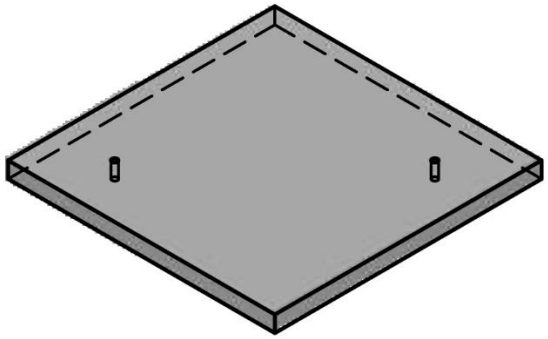


All numbers in mm
thickness: 0,3 mm

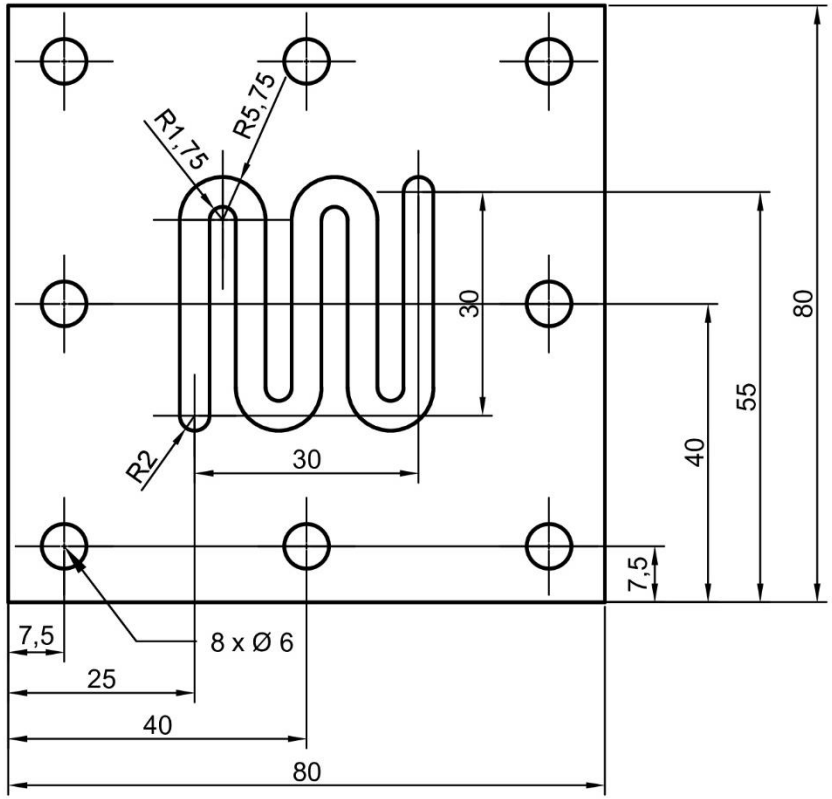


Example of electrode with holes.
Thickness can be varied

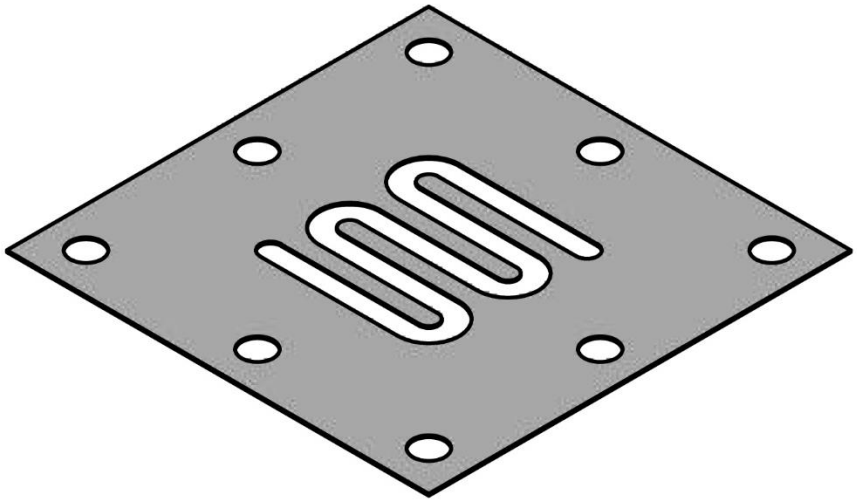




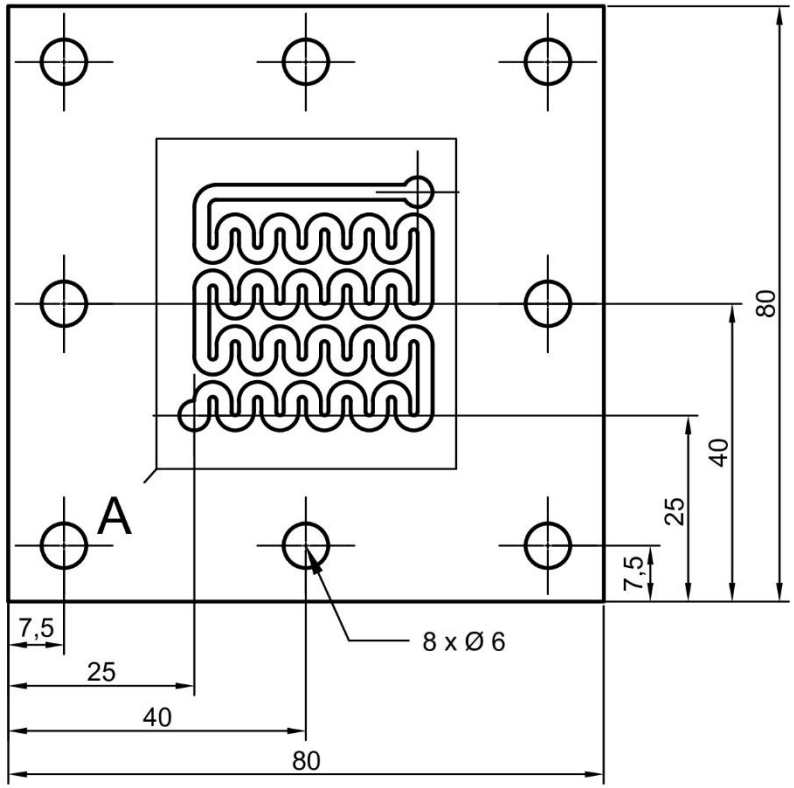
All numbers in mm



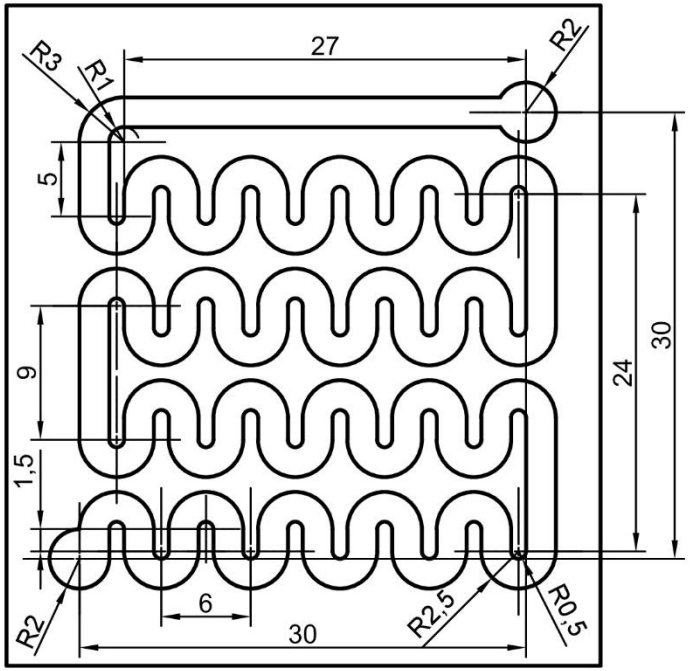
Electrode surface contact area: 6.4 cm²
Volume (for 0.3 mm thickness): 190 µL



All numbers in mm
thickness: 0,3 mm

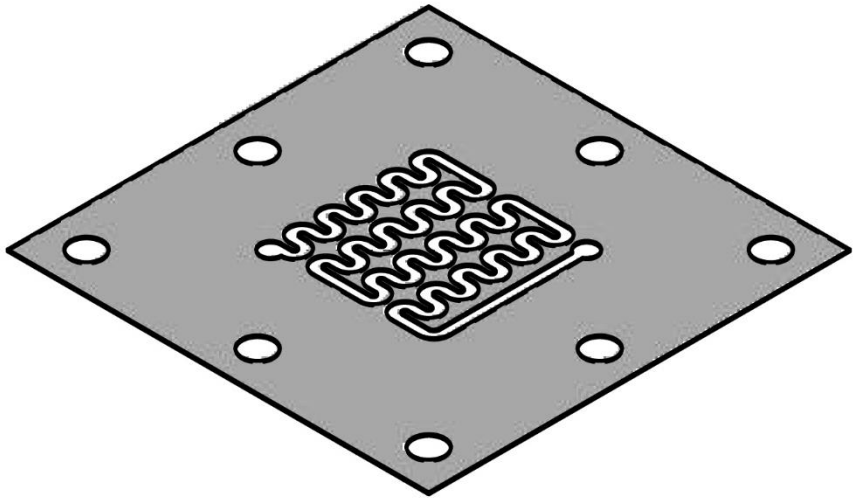


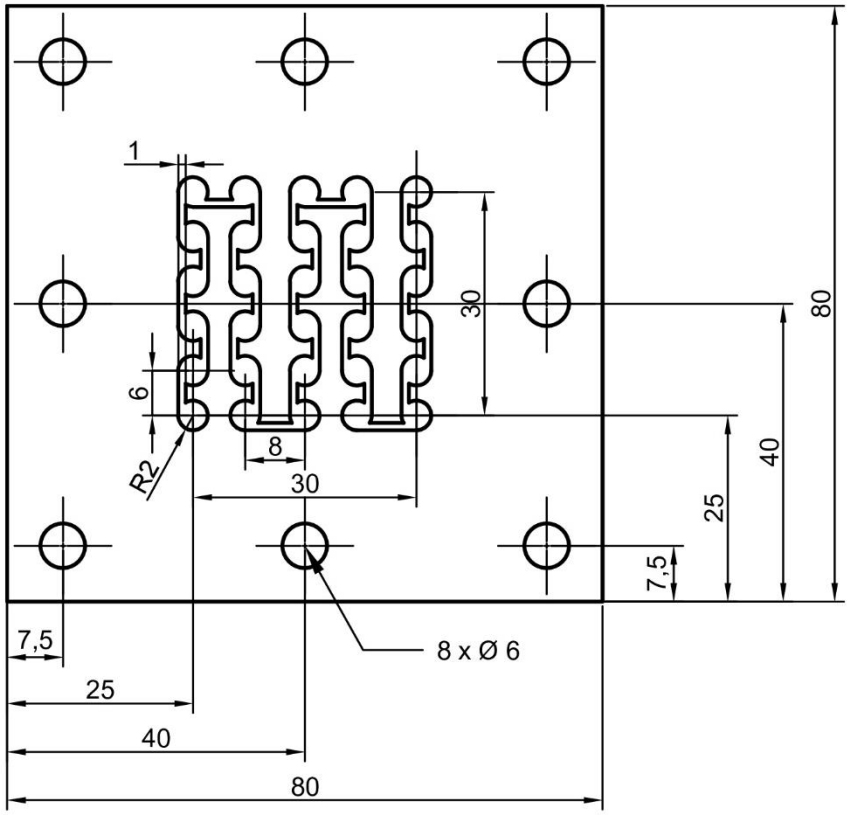
A (2:1)



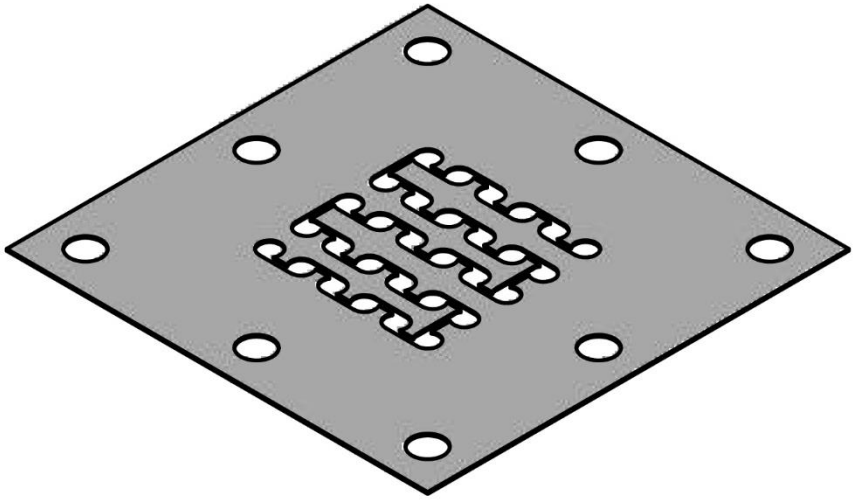
Electrode surface contact area: 5.0 cm^2
Volume (for 0.3 mm thickness): 150 µL

All numbers in mm
thickness: 0,3 mm





Electrode surface contact area: 4.1 cm^2
Volume (for 0.3 mm thickness): 120 µL



All numbers in mm
thickness: 0,3 mm

Copies of NMR Spectra of the Isolated Product