



Wrocław  
University  
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Wrocław Centre  
for Technology Transfer

# The miniature electrochemical cell for the energy storage - SUPERCAPACITOR



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STATUS IP: Know-how

COMMERCIALIZATION: Sale, Implementation agreement,  
Another agreement

TECHNOLOGY READINESS LEVEL: Experimental validation of the concept

## TECHNICAL DETAILS

According to the know-how, 3D printing and microfluidic techniques are used to make the electrochemical cell. The case of the structure is made by 3D printing, in the next step the electrodes and an electrolyte are introduced by microfluidic techniques. This allows for the production of any electrode system (shape and dimensions) from any chosen materials. Such a way of production allows tuning the performance of the electrochemical cell (including capacity). The formation of the electrodes in the third dimension and, as the result, the control of parameter such as capacity allows that any design of the electrode can be produced. Single cells can be easily connected into modules.

## APPLICATIONS / MARKETS

Production of battery cells - batteries and supercapacitors.  
The possibility of producing supercapacitors for powering the consumer goods.

## INNOWACYJNOŚĆ

- The electrochemical cell can be hermetic structure;
- The electrochemical cell can be easily integrated with other devices ensuring the system miniaturization;
- The production of cells doesn't require the so-called dry room or glove-box equipment (thanks to the encapsulation and microfluidic system);
- Any design of the electrodes is possible;
- Easy modulation of cell properties (including capacity);
- At the current research level the single cell measures approx. 1 cm<sup>3</sup>;
- Energy density is from 140 Wh/kg to about 3,4 kWh/kg, at the weight of the cell 0.5 – 1 g.

