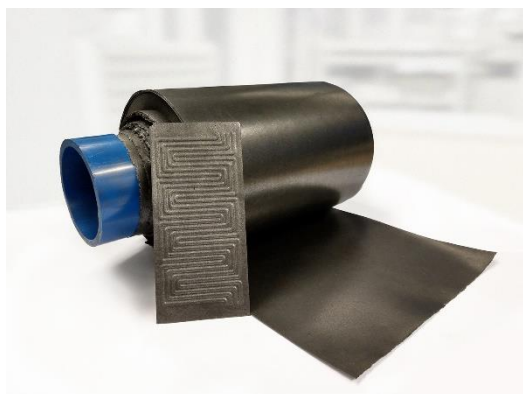


## Electrically Conductive Polymers

[Thermoplastic-based bipolar plates e.g. for batteries and fuel cells]

Electrochemical storages such as batteries or energy converters such as fuel cells are key technologies for the successful implementation of the energy transition. In batteries and fuel cells, bipolar plates connect several cells in a cell stack compactly, resource-saving and with full-surface contact. Bipolar plates made from metallic materials can be manufactured very thinly, but their high specific weight and low corrosion resistance are disadvantages. Polymer-based bipolar plates as a corrosion-free alternative previously had the disadvantage that they had extremely high material thicknesses, had to be machined or, depending on the material, could not be subsequently formed. Thermoplastic-based bipolar plates, on the other hand, offer significant advantages: In addition to being corrosion-free, they are characterized by a low material thickness and the ability to be subsequently formed and embossed.



*Redox flow cell and bipolar plate manufactured using roll-to-roll technique.*

### Solutions and services of Fraunhofer UMSICHT

We develop thermally and electrically conductive polymer compounds that can be processed into thermoplastic-based bipolar plates with different filler contents. Depending on the filler content of electrically conductive additives, these can be used in a variety of technical applications: in electrochemical storages (batteries), in energy converters (fuel cells), in chemical-resistant heat exchangers or as resistance heating elements. The realization of low material thicknesses, as well as the continuous production method, enables a cost-effective and resource-saving production of electrically conductive polymer plates or films.

### Unique selling points

With our bipolar plate material, we offer a thermally and electrically conductive polymer-based compound that is produced cost-efficiently in continuous roll-to-roll production. Thanks to this new manufacturing process, bipolar plates can be produced in low material thicknesses while saving materials and resources. Our bipolar plates are highly electrically conductive, flexible, mechanically stable, gas-tight, and chemically resistant, formable and weldable. In addition to the free choice of conductive additives, other low-temperature and especially high-temperature thermoplastics can be used. This extends the scope for electrically conductive polymers

*Fraunhofer is one of the world's largest applied R&D organizations, with nearly 80 research units in all sectors of industry, 30000 employees and an annual outlay of Euros 2.9 billion. Of this sum, 2.4 billion euros is generated through contract research. Our global footprint is very strong, with offices and research centers in the Europe, USA and Asia. Some of our renowned innovations are the MP3 format, the white LED, the smallest of cameras. Fraunhofer covers the entire spectrum of energy (Renewables, Storage, E-Mobility, Grid, Hydrogen...) across the value chain from materials to testing and certification. Fraunhofer has been active in India since the past several years, bringing innovative technologies and research competence to India. Fraunhofer in India is the chosen R&D and innovation technology partner of some of the major players in the field of Energy, Environment, Automotive, Electro-mobility, Materials, Production Technology and Smart Cities working with Industry, Government and Public Sector.*

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Kindly get in touch with us if you are interested in this technology or require further information.

Thanks and Regards,

Ms. Anandi Iyer  
Director, Fraunhofer Office India

Mr. Sanmati Naik  
Sr. Manager - Energy (RE), Fraunhofer Office India  
405-406, 30 MG Road, Bengaluru – 1  
E-Mail: [sanmati.naik@fraunhofer.in](mailto:sanmati.naik@fraunhofer.in)  
Tel: +91 80 40965008/09  
[www.fraunhofer.in](http://www.fraunhofer.in) [www.fraunhofer.de](http://www.fraunhofer.de)