

Highly filled polymer/graphite materials

Development of polymer/graphite-based materials for use

- as bipolar plate in fuel cells and redox-flow batteries
- as heat exchanger plate in plate heat exchangers

The precondition for this is

- high electrical conductivity (fuel cell, redox-flow battery) and/or
- high thermal conductivity (fuel cell, plate heat exchanger)

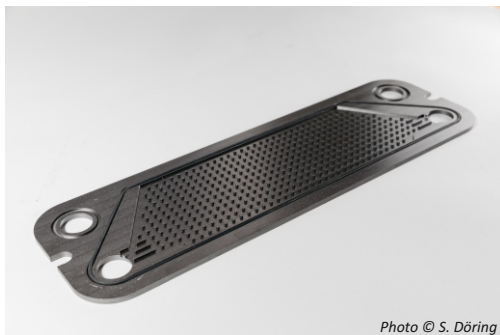


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Polymer/graphite composite heat exchanger plate

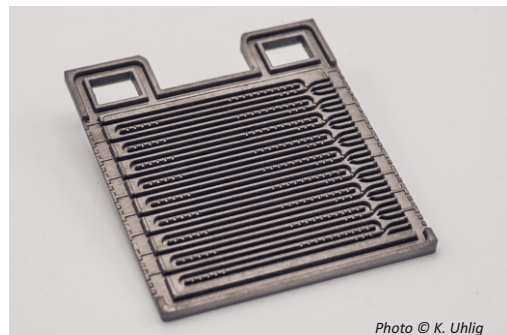


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Structured bipolar plate for fuel cells and redox-flow batteries of the company Eisenhuth GmbH & Co.KG

Demonstratoren

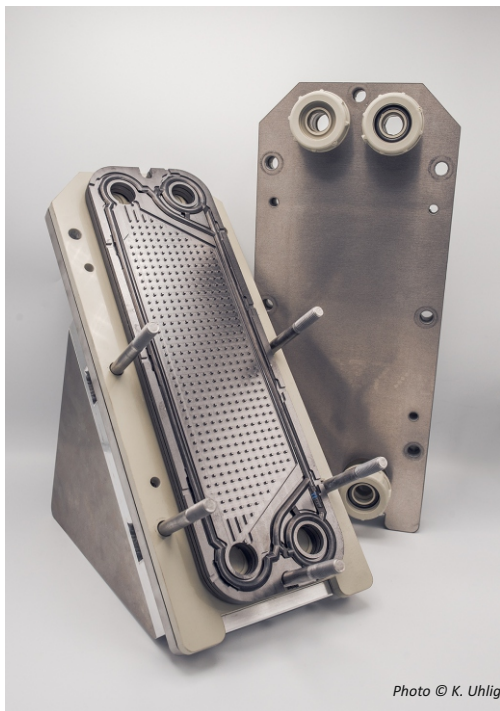


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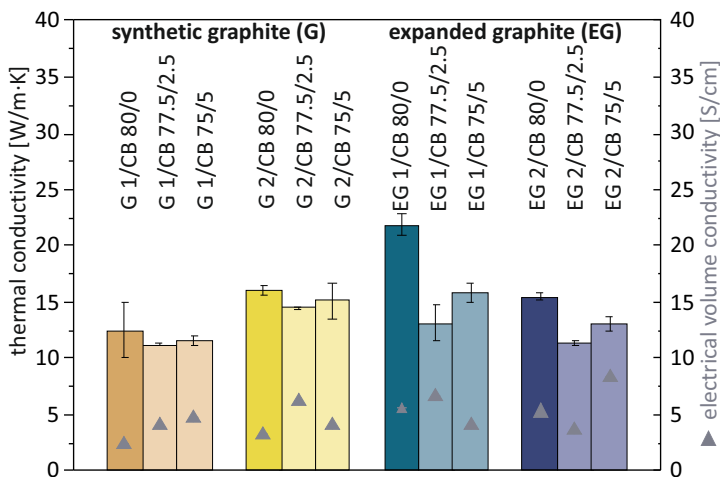
Plate heat exchanger - demonstrator of the company Calorplast Wärmetechnik GmbH



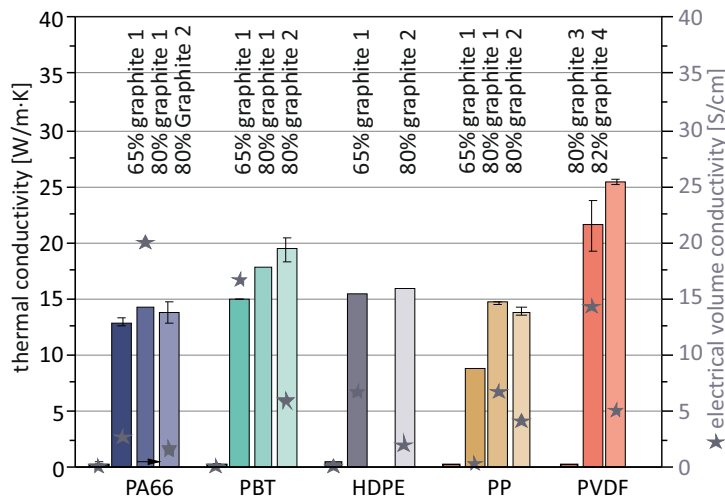
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Redox-flow battery stack - demonstrator of the company Eisenhuth GmbH & Co.KG

The polymer/graphite plates can transfer five times the amount of heat compared to polymer plates.



Filler contents of up to 80 wt% graphite were incorporated into polypropylene, whereby both the type and particle size of the graphite have a significant influence on the achievable conductivities of the composites. By using filler mixtures of graphite (G) and carbon black (CB), electrical conductivity can be increased at the cost of thermal conductivity.



Compositions of various polymers such as polyamide (PA), polybutylene terephthalate (PBT), polyethylene (PE), polypropylene (PP), polyvinylidene fluoride (PVDF) and various graphites were developed and investigated.

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