

Graphite-Polymer Plate in Frame Heat Exchanger

Plastic heat exchangers are the most reliable solution for heat transfer in an aggressive media environment. By using the latest technology of graphite filled thermoplastic composite, the thermal conductivity could be significantly increased (Fig. 1). The addition of graphite has quintupled the heat transfer coefficient (Fig 2).

The heat exchanger plates can be made of different polymer matrices such as polypropylene (PP), polyvinylidene fluoride (PVDF) or polyethylene (PE) depending on the requirements for chemical resistance. The graphitic plates are stacked and clamped between two metal plates.

The heat exchanger can be used for cooling, heating or condensing of corrosive media.

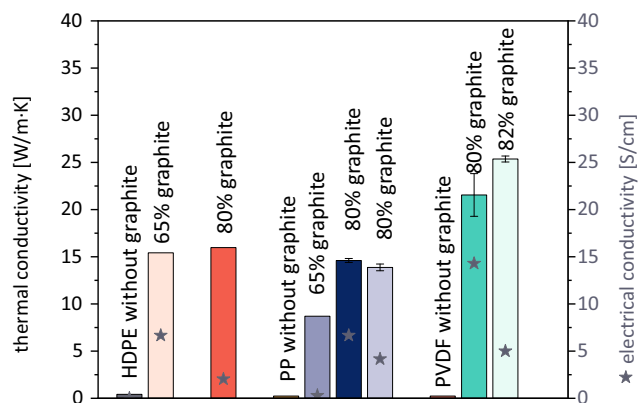
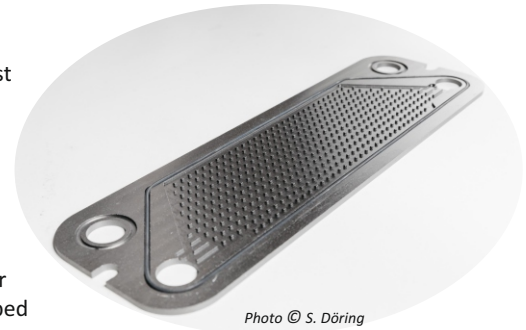


Fig. 1:
Thermal and electrical conductivity of graphite-polymer plates

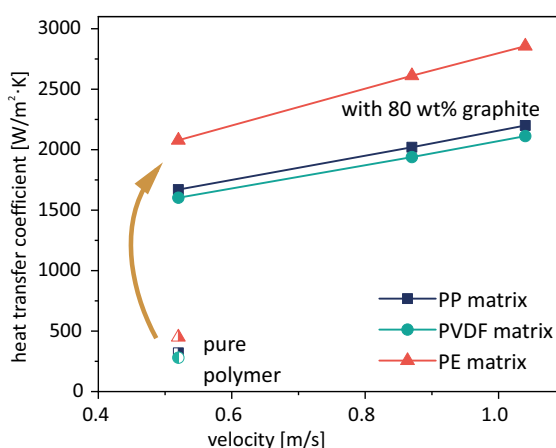
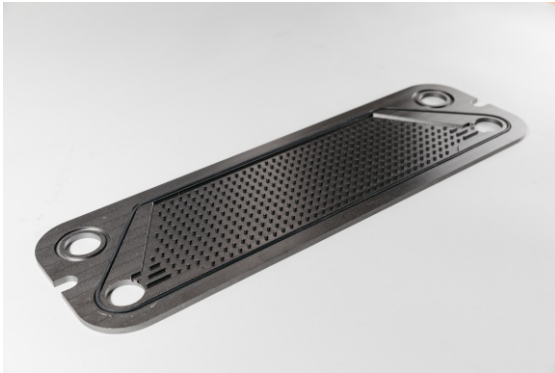


Fig.2 :
Heat transfer coefficient (liquid/liquid) depending on the velocity between the plates

Applications

- salt solutions: marine, aquarium, fish farming
- acid-solutions: plating and chemical applications
- solvents: condensation applications
- electrolyte: battery cooling (redox-flow-battery)



Heat exchanger plate (Photo © S. Döring)



Schematic construction of the plate heat exchanger (picture © Calorplast Wärmetechnik GmbH)

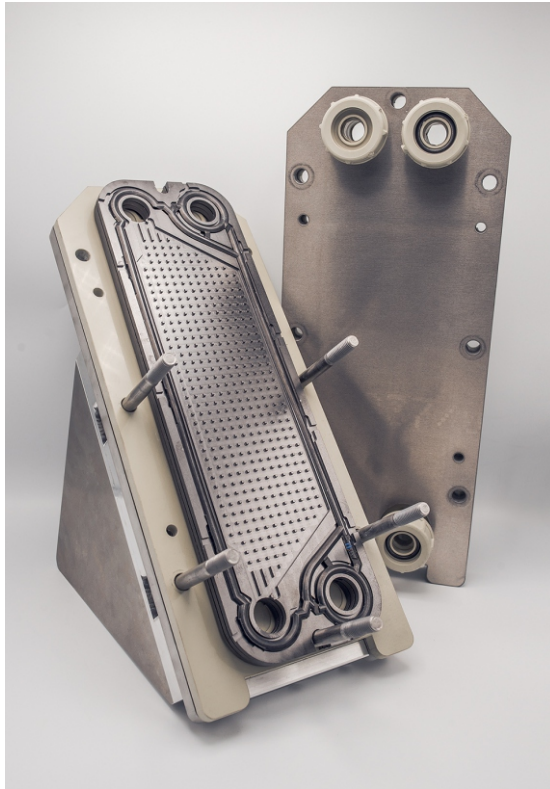


Plate heat exchanger - Demonstrator of the company Calorplast Wärmetechnik GmbH (Photo © K. Uhlig)

Technical Data

materials:	graphite - (PP/ PVDF / PE) matrix
operation temperatures:	-20 to +100°C (depending on polymer)
operation pressure:	4 bar
pressure drop:	100 – 500 mbar
heat transfer area:	0.03 – 1.5 m ²

References

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